



ElectricAccelerator Installation and Configuration Guide

Version 9.1

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ElectricAccelerator Version 9.1

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Chapter 1: Overview

This guide describes the system requirements for installing and running ElectricAccelerator® and contains instructions for installing each component on every supported platform. This guide also contains instructions for performing initial configuration and upgrades.

- [About ElectricAccelerator](#)
- [Understanding Component Interactions](#)
- [When to Use the ElectricAccelerator Cluster](#)
- [Grid Integration](#)

About ElectricAccelerator

ElectricAccelerator (Accelerator) reduces software build times by distributing the build over a large cluster of inexpensive servers. By using a dependency management system, Accelerator identifies and fixes problems in real time that would break traditional parallel builds. Accelerator seamlessly plugs into existing software development environments and includes web-based management and reporting tools.

Accelerator consists of the following components:

- [Cluster Manager](#)
- [ElectricAccelerator Agents](#)
- [Electric File System](#)
- [eMake](#)
- [Electrify](#)

Cluster Manager

The Cluster Manager machine is a server that contains two layers: a service layer to allocate agents to builds, collect build results, and monitor system activity, and a web server layer for the web interface.

The Cluster Manager also lets users view upcoming and past builds, view the status of agents in the cluster, and run reports.

ElectricAccelerator Agents

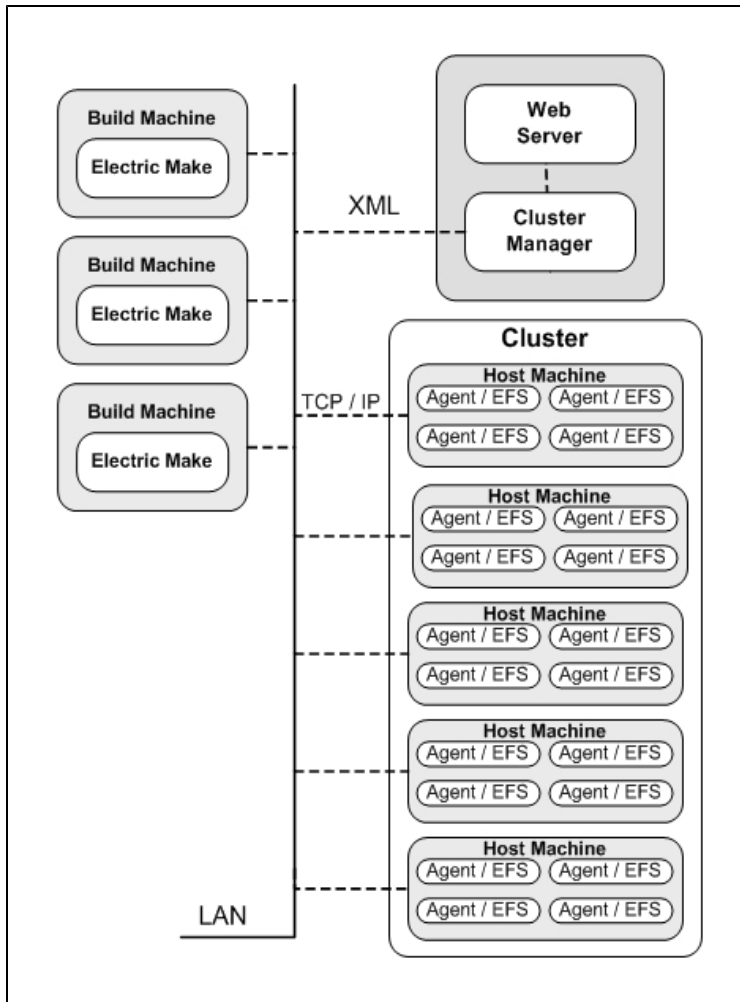
As the user-level component running on the hosts, an Electric Agent ("agent") and EFS are inseparable—an agent is an intermediary between eMake and EFS. Depending on your system configuration, you might have one EFS/agent pair installed per core. (Or if your CPU supports hyper-threading, you might want to run slightly more agents per core; 1.25 or 1.5 per core is a good rule-of-thumb.) Agents run commands on behalf of eMake.

Electric File System

The Electric File System (EFS) is a special-purpose file system driver that monitors every file access and provides eMake with complete usage information. This driver collects dependency information, which lets eMake detect and correct out-of-order build steps automatically. Each EFS driver instance is paired with an ElectricAccelerator agent. During installation, the agent and EFS are installed at the same time.

eMake

eMake, the main build application, is a new Make version invoked interactively or through build scripts. It reads makefiles in several different formats, including GNU Make and Microsoft NMAKE. eMake distributes commands to the cluster for remote execution and services file requests.



You can either use a cluster manager or only the agents on the local host. If neither is specified but eMake detects that agents are running on the host, eMake uses them as if you specified to use only the agents on the local host. The Cluster Manager prefers to allocate agents to eMake that are on the same host as eMake.

Electrify

The Electrify component accelerates builds by parallelizing the build process and distributing build steps across clustered resources. You can use one of two methods to monitor your tools: a wrapper application or automatic process interception. For details about using Electrify, see the “Electrify” chapter of the *ElectricAccelerator Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html.

Understanding Component Interactions

To a user, Accelerator might appear identical to other Make versions—reading makefiles in several different formats and producing identical results. Using a cluster for builds is transparent to the Accelerator user.

Following are some important differences in Accelerator build processing versus other distributed systems:

- Accelerator components work together to achieve faster, more efficient builds. Instead of running a sequential build on a single processor, Accelerator executes build steps in parallel on a cluster of hosts.
- For fault tolerance, job results are isolated until the job completes. If an agent fails during a job, Accelerator discards any partial results it might have produced and reruns the job on a different agent.

- Missing dependencies discovered at runtime are collected in a history file that updates each time a build is invoked. Accelerator uses this collected data to improve performance of subsequent builds.

eMake and EFS

EFS enables high concurrency levels in Accelerator. When a job such as a compilation runs on a host, it accesses files such as source files and headers through EFS. EFS records detailed file-access data for the build and returns that data to eMake.

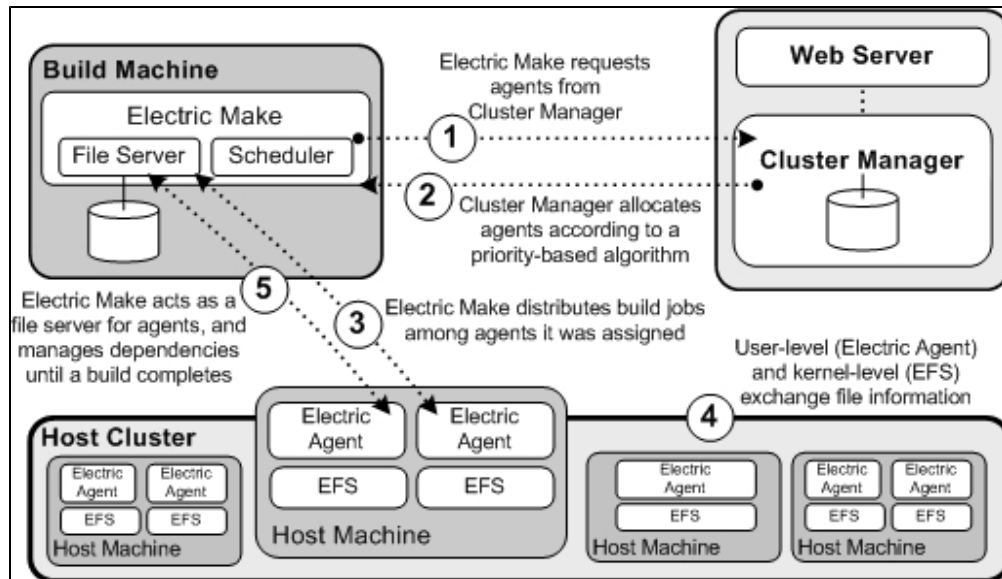
eMake acts as a file server for agents by dynamically virtualizing the host file system to cluster nodes while the build is running. The agent relays file data from eMake into the kernel, then notifies EFS, which then completes the original request. At the end of a job, the agent returns any file modifications to eMake, so that it can apply changes to its local file systems.

eMake and the Cluster Manager

When eMake is invoked on the build machine, it communicates with the Cluster Manager to acquire a set of agents that it can use for the build. When eMake finishes, it sends the Cluster Manager the build results and tells the Cluster Manager that agents are free now to work on other builds. If more than one build is invoked, the Cluster Manager allocates agents using a priority-based algorithm. Builds with the same priority share agents evenly, while higher-priority builds are allocated more agents than lower-priority builds. By default, agents running on the same host machine are allocated to the same build. In real time, the Cluster Manager dynamically adjusts the number of agents assigned to running builds as each build's needs change, which allows Accelerator to make the best use of cluster resources.

Cluster Manager and Other Components

The Cluster Manager's primary responsibility is agent allocation. Also, through the Cluster Manager, you create and maintain the build infrastructure (build classes, user access, and build history details), and you manage agent activity.



When to Use the ElectricAccelerator Cluster

Accelerator is designed to be a complete replacement for GNU Make or Microsoft NMAKE. It has the same command-line switches, produces identical output, and (with a few exceptions) reads your existing makefiles without change. Wherever you are currently invoking *gmake* or *nmake*—in a script, from a batch process, or interactively—you can run eMake to distribute the work to the Cluster Manager and complete your build faster.

In some cases, however, distributed builds are not always faster. In particular, if a build has very little work to do or has much higher I/O activity compared to computation, it can be faster to allow the build to execute locally. The best examples of these build types are

- “Clean” targets – these often do little more than large recursive deletes.
- “One touch” build—a build consisting of nothing more than zero or one compilations followed immediately by a large link.

But then, depending on the build specifics, the cluster might outperform local builds for a large class of “clean” target or “one touch” builds—it is best to experiment with a few common configurations to determine which mode is more efficient. Typically, if a build has two or more jobs it can execute concurrently, running the build on the cluster is more efficient.

If you find that some common “clean” or “one touch” builds are faster when run locally, you can run eMake in local mode. In local mode, eMake behaves exactly like your existing Make, running all jobs in series on the local system.

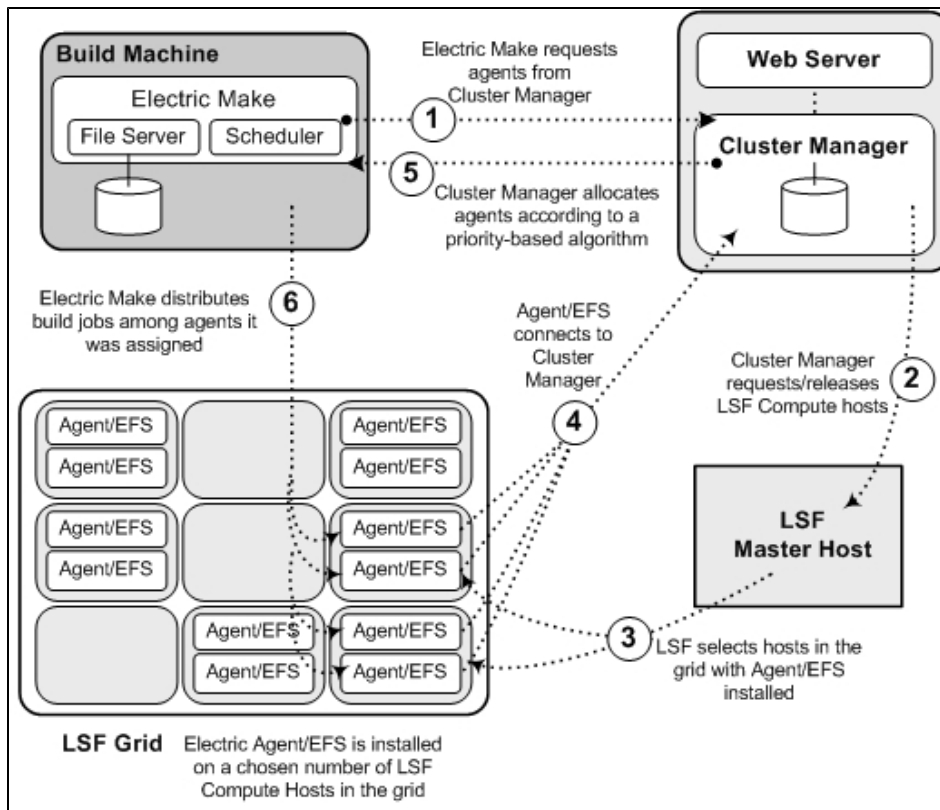
Grid Integration

If you plan to use a host grid with Accelerator, the following list shows the relationship between Accelerator components and the grid management software, such as LSF or Oracle Grid Engine.

- Electric Make does not interact directly with the grid management software—Electric Make can run inside or outside of a grid.
- Agent/EFS software is designed to run on grid execution hosts. While the agent/EFS does not “talk” to the grid management software, the agent/EFS can be activated by it, effectively creating a dynamically-sized Accelerator cluster.
- Cluster Manager interfaces with the grid management software to add or subtract machines to or from the Accelerator cluster as build demands increase or decrease.

Note: Grid management client software must be installed on the designated Cluster Manager server *before* Cluster Manager is used in grid mode.

The following diagram illustrates how Accelerator interacts with grid management software, using LSF as an example.



For additional information about planning for and using a grid, see these topics:

- [Planning for Grid Use](#)
- [Enabling Grid Host Manager](#)
- [Configuring LSF](#)

Chapter 2: Supported Platforms and System Requirements

This section discusses the hardware and system requirements for Accelerator. To ensure a successful installation and best performance, you should make sure that your software environment and your hardware meet the applicable requirements in this chapter before installing Accelerator.

- [Supported Linux Platforms](#)
- [Supported Windows Platforms](#)
- [Supported Solaris Platforms](#)
- [Supported Third-Party Build Tools](#)
- [Hardware Requirements](#)
- [Web Browser Requirements](#)
- [Port Usage](#)
- [Toolchain](#)
- [Database Requirements](#)
- [Cygwin](#)
- [Component Compatibility Matrix](#)
- [Ensuring a Consistent Build Environment](#)
- [Planning for Grid Use](#)
- [Checksum Utility](#)

Supported Linux Platforms

This section describes the Linux platforms that are supported by the Cluster Manager, eMake, and Electric Agent/EFS.

- [Cluster Manager Linux Platforms](#)
- [eMake and Agent Linux Platforms](#)

Cluster Manager Linux Platforms

The Cluster Manager runs on the platforms described in the following sections.

- [Debian Linux Cluster Manager Platforms](#)
- [Red Hat Enterprise Linux Cluster Manager Platforms](#)
- [SUSE Linux Enterprise Server Cluster Manager Platforms](#)
- [Ubuntu Linux Cluster Manager Platforms](#)

For the latest updates to this information, see the *ElectricAccelerator Release Notes* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html.

Debian Linux Cluster Manager Platforms

Platform	Notes
Debian 8 (kernel 3.16) (64-bit)	<ul style="list-style-type: none">• You must install the ia32-libs-multiarch 32-bit compatibility libraries before invoking the installer. If you are installing Agents, you must also install the libgcc1:i386 library. (Specific libraries might vary depending on your specific distribution.)
Debian 7 (kernel 3.2) (64-bit)	<ul style="list-style-type: none">• You must install the ia32-libs 32-bit compatibility libraries before invoking the installer. If you are installing Agents, you must also install the libgcc1:i386 library. (Specific libraries might vary depending on your specific distribution.)

Red Hat Enterprise Linux Cluster Manager Platforms

Platform	Notes
RHEL 7.3 (kernel 3.10.0-514) (64-bit) RHEL 7.2 (kernel 3.10.0-327) (64-bit) RHEL 7.1 (kernel 3.10.0-229) (64-bit) RHEL 7.0 (kernel 3.10.0-123) (64-bit)	<ul style="list-style-type: none">• You must install 32-bit libraries before invoking the installer. The libstdc++.i686 library must be installed.• Run <code>yum install glibc.i686</code>. If a yum server is not present, the required RPMs are <code>glibc-2.11.1.1.10.el6.i686</code> and <code>nss-softoken-freebl-3.12.4-11.el6.i686</code>.• IA-64 (Itanium) is not supported.• The XFS and ext4 file systems are supported.

Platform	Notes
RHEL 6.9 (kernel 2.6.32-696) (64-bit) RHEL 6.8 (kernel 2.6.32-642) (64-bit) RHEL 6.7 (kernel 2.6.32-573) (64-bit) RHEL 6.6 (kernel 2.6.32-504) (64-bit) RHEL 6.5 (kernel 2.6.32-431) (64-bit) RHEL 6.4 (kernel 2.6.32-358) (64-bit) RHEL 6.3 (kernel 2.6.32-279) (64-bit) RHEL 6.2 (kernel 2.6.32-220) (64-bit) RHEL 6.1 (kernel 2.6.32-131) (64-bit) RHEL 6.0 (kernel 2.6.32-71) (64-bit)	<ul style="list-style-type: none"> For 64-bit systems, you must install 32-bit libraries before invoking the installer. The <code>libstdc++.i686</code> library must be installed. Run <code>yum install glibc.i686</code>. If a yum server is not present, the required RPMs are <code>glibc-2.11.1.1.10.el6.i686</code> and <code>nss-softoken-freebl-3.12.4-11.el6.i686</code>. IA-64 (Itanium) is not supported.
RHEL 5.11 (kernel 2.6.18-398) (64-bit) RHEL 5.9 (kernel 2.6.18-348) RHEL 5.8 (kernel 2.6.18-308) RHEL 5.7 (kernel 2.6.18-274) RHEL 5.6 (kernel 2.6.18-238) RHEL 5.5 (kernel 2.6.18-194) RHEL 5.4 (kernel 2.6.18-164) (64-bit)	<ul style="list-style-type: none"> IA-64 (Itanium) is not supported.

SUSE Linux Enterprise Server Cluster Manager Platforms

Platform	Notes
SLES 12 (kernel 3.12.28) (64-bit)	<ul style="list-style-type: none"> To install <code>gcc</code>, run <code>sudo zypper install gcc</code>. This installs the following: <code>gcc</code>, <code>gcc43</code>, <code>glibc-devel</code>, <code>linux-kernel-headers</code>. To install <code>kernel-source</code>, run <code>sudo zypper install kernel-source</code> IA-64 (Itanium) is not supported.
SLES 11 SP2 (kernel 3.0.34) (64-bit)	
SLES 11 SP1 (kernel 2.6.32) (64-bit)	
SLES 11 (kernel 2.6.27) (64-bit)	

Ubuntu Linux Cluster Manager Platforms

Platform	Notes
Ubuntu Linux 16.04 (kernel 4.4.0-18) (64-bit)	<ul style="list-style-type: none"> For 64-bit systems, you must install 32-bit compatibility libraries before invoking the installer. (Specific libraries might vary depending on your specific distribution.) On older Linux versions such as 12.04 and 12.10, install <code>ia32-libs</code> (to do so, use the <code>sudo apt-get install ia32-libs</code> command). On newer Ubuntu versions such as 14.04, install the <code>ia32-libs-multiarch</code> libraries. IA-64 (Itanium) is not supported.
Ubuntu Linux 15.10 (kernel 4.2.0-34) (64-bit)	
Ubuntu 15.04 (kernel 3.19) (64-bit)	
Ubuntu 14.10 (kernel 3.16) (64-bit)	
Ubuntu 14.04 (kernel 3.13) (64-bit)	

eMake and Agent Linux Platforms

eMake and Electric Agent/EFS run on the platforms described in the following sections.

- [Debian Linux eMake and Agent Platforms](#)
- [Red Hat Enterprise Linux eMake and Agent Platforms](#)
- [SUSE Linux Enterprise Server eMake and Agent Platforms](#)
- [Ubuntu Linux eMake and Agent Platforms](#)

For the latest updates to this information, see the *ElectricAccelerator Release Notes* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html

Debian Linux eMake and Agent Platforms

Platform	Notes
Debian 8 (kernel 3.16) (64-bit)	<ul style="list-style-type: none"> You must install the <code>ia32-libs-multiarch</code> 32-bit compatibility libraries before invoking the installer. If you are installing Agents, you must also install the <code>libgcc1:i386</code> library. (Specific libraries might vary depending on your specific distribution.) SELinux must be disabled. To disable SELinux, modify <code>/etc/selinux/config</code> by changing <code>SELINUX=enforcing</code> to <code>SELINUX=disabled</code>.
Debian 7 (kernel 3.2) (64-bit)	<ul style="list-style-type: none"> You must install the <code>ia32-libs</code> 32-bit compatibility libraries before invoking the installer. If you are installing Agents, you must also install the <code>libgcc1:i386</code> library. (Specific libraries might vary depending on your specific distribution.)

Red Hat Enterprise Linux eMake and Agent Platforms

Platform	Notes
RHEL 7.3 (kernel 3.10.0-514) (64-bit) RHEL 7.2 (kernel 3.10.0-327) (64-bit) RHEL 7.1 (kernel 3.10.0-229) (64-bit) RHEL 7.0 (kernel 3.10.0-123) (64-bit)	<ul style="list-style-type: none">• For agent hosts, you must install the correct <code>kernel-devel</code> package before invoking the installer. To install this package, you can enter the <code>yum install kernel-devel-`uname -r`</code> command.• You must install 32-bit libraries before invoking the installer. The <code>libstdc++.i686</code> library must be installed.• Run <code>yum install glibc.i686</code>. If a yum server is not present, the required RPMs are <code>glibc-2.11.1.1.10.el6.i686</code> and <code>nss-softoken-freebl-3.12.4-11.el6.i686</code>.• Be advised of a known Linux kernel issue.• SELinux must be disabled. To disable SELinux, modify <code>/etc/selinux/config</code> by changing <code>SELINUX=enforcing</code> to <code>SELINUX=disabled</code>.• Only x86-64 is supported. IA-64 (Itanium) is not supported.• The XFS and ext4 file systems are supported.

Platform	Notes
RHEL 6.9 (kernel 2.6.32-696) (32- and 64-bit) RHEL 6.8 (kernel 2.6.32-642) (32- and 64-bit) RHEL 6.7 (kernel 2.6.32-573) (32- and 64-bit) RHEL 6.6 (kernel 2.6.32-504) (32- and 64-bit) RHEL 6.5 (kernel 2.6.32-431) (32- and 64-bit) RHEL 6.4 (kernel 2.6.32-358) (32- and 64-bit) RHEL 6.3 (kernel 2.6.32-279) (32- and 64-bit) RHEL 6.2 (kernel 2.6.32-220) (32- and 64-bit) RHEL 6.1 (kernel 2.6.32-131) (32- and 64-bit) RHEL 6.0 (kernel 2.6.32-71) (32- and 64-bit)	<ul style="list-style-type: none"> For agent hosts, you must install the correct <code>kernel-devel</code> package before invoking the installer. To install this package, you can enter the <code>yum install kernel-devel-`uname -r`</code> command. For 64-bit systems, you must install 32-bit libraries before invoking the installer. The <code>libstdc++.i686</code> library must be installed. Run <code>yum install glibc.i686</code>. If a yum server is not present, the required RPMs are <code>glibc-2.11.1.1.10.el6.i686</code> and <code>nss-softoken-freebl-3.12.4-11.el6.i686</code>. Be advised of a known Linux kernel issue. SELinux must be disabled. To disable SELinux, modify <code>/etc/selinux/config</code> by changing <code>SELINUX=enforcing</code> to <code>SELINUX=disabled</code>. For 32-bit, only x86 is supported. For 64-bit, only x86-64 is supported. IA-64 (Itanium) is not supported.
RHEL 5.11 (kernel 2.6.18-398) (32- and 64-bit) RHEL 5.9 (kernel 2.6.18-348) RHEL 5.8 (kernel 2.6.18-308) RHEL 5.7 (kernel 2.6.18-274) RHEL 5.6 (kernel 2.6.18-238) RHEL 5.5 (kernel 2.6.18-194) RHEL 5.4 (kernel 2.6.18-164) (32- and 64-bit)	<ul style="list-style-type: none"> For agent hosts, you must install the correct <code>kernel-devel</code> package before invoking the installer. To install this package, you can enter the <code>yum install kernel-devel-`uname -r`</code> command. Be advised of a known Linux kernel issue. SELinux must be disabled. To disable SELinux, modify <code>/etc/selinux/config</code> by changing <code>SELINUX=enforcing</code> to <code>SELINUX=disabled</code>. For 32-bit, only x86 is supported. For 64-bit, only x86-64 is supported. IA-64 (Itanium) is not supported.

SUSE Linux Enterprise Server eMake and Agent Platforms

Platform	Notes
SLES 12 (kernel 3.12.28) (64-bit)	<ul style="list-style-type: none"> For agent hosts, you must install the <code>gcc</code> and <code>kernel-source</code> packages before invoking the installer. To install <code>gcc</code>, run <code>sudo zypper install gcc</code>. This installs the following: <code>gcc</code>, <code>gcc43</code>, <code>glibc-devel</code>, <code>linux-kernel-headers</code>. To install <code>kernel-source</code>, run <code>sudo zypper install kernel-source</code>. SELinux must be disabled. To disable SELinux, modify <code>/etc/selinux/config</code> by changing <code>SELINUX=enforcing</code> to <code>SELINUX=disabled</code>. For 32-bit, only x86 is supported. For 64-bit, only x86-64 is supported. IA-64 (Itanium) is not supported.
SLES 11 SP2 (kernel 3.0.34) (32- and 64-bit)	
SLES 11 SP1 (kernel 2.6.32) (32- and 64-bit)	
SLES 11 (kernel 2.6.27) (32- and 64-bit)	

Ubuntu Linux eMake and Agent Platforms

Platform	Notes
Ubuntu Linux 16.04 (kernel 4.4.0-18) (64-bit)	<ul style="list-style-type: none"> For 64-bit systems, you must install 32-bit compatibility libraries before invoking the installer. (Specific libraries might vary depending on your specific distribution.) On older Linux versions such as 12.04 and 12.10, install <code>ia32-libs</code> (to do so, use the <code>sudo apt-get install ia32-libs</code> command). On newer Ubuntu versions such as 14.04, install the <code>ia32-libs-multiarch</code> libraries. SELinux must be disabled. To disable SELinux, modify <code>/etc/selinux/config</code> by changing <code>SELINUX=enforcing</code> to <code>SELINUX=disabled</code>. For 32-bit, only x86 is supported. For 64-bit, only x86-64 is supported. IA-64 (Itanium) is not supported. Be advised of a known Linux kernel issue.
Ubuntu Linux 15.10 (kernel 4.2.0-34) (64-bit)	
Ubuntu 15.04 (kernel 3.19) (64-bit)	
Ubuntu 14.10 (kernel 3.16) (64-bit) Ubuntu 14.04 (kernel 3.13) (32- and 64-bit)	

Known Linux Kernel Issue and ElectricAccelerator Performance

Affected Kernel Versions

- RHEL kernel versions later than 2.6.18-194.32 and earlier than 2.6.32-131.
- Ubuntu kernel versions 2.6.31, 32, 33, and 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 your environment has this kernel issue, run

```
dmesg | grep hung_task_timeout
```

If hung_task_timeout errors are present, this indicates that a known Linux kernel issue is present. Contact your kernel provider to obtain a different version of the precompiled kernel.

Corrective Actions

For systems running RHEL 5.6, 5.7, 5.8, and 6.0

Consider upgrading to 2.6.32-131 (RHEL 6.1) or downgrading to 2.6.18-194.32 (RHEL 5.5).

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

Supported Windows Platforms

The Cluster Manager, eMake, and Electric Agent/EFS run on the platforms described in the following sections.

For the latest updates to this information, see the *ElectricAccelerator Release Notes* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html

Platform	Notes
Windows 10 (64-bit only)	<ul style="list-style-type: none">• NTFS is required.• For 64-bit, only x86-64 is supported. IA-64 (Itanium) is not supported.• To run eMake with Visual Studio on Windows, one of the following is required:<ul style="list-style-type: none">• Visual Studio 2005 SP1• Visual Studio 2005 SP1 Redistributable Package. A link is provided for your convenience: 64-bit
Windows 8 (64-bit)	<ul style="list-style-type: none">• NTFS is required.• Only x86-64 is supported. IA-64 (Itanium) is not supported.• To run eMake with Visual Studio on Windows, one of the following is required:<ul style="list-style-type: none">• Visual Studio 2005 SP1• Visual Studio 2005 SP1 Redistributable Package. A link is provided for your convenience: 64-bit

Platform	Notes
Windows 7 (32 or 64-bit)	<ul style="list-style-type: none"> • NTFS is required. • For 32-bit, only x86 is supported. For 64-bit, only x86-64 is supported. IA-64 (Itanium) is not supported. • To run eMake with Visual Studio on Windows, one of the following is required: <ul style="list-style-type: none"> • Visual Studio 2005 SP1 • Visual Studio 2005 SP1 Redistributable Package. Links are provided for your convenience: 32-bit 64-bit
Windows Server 2016 (64-bit only) Windows Server 2012 (64-bit only)	<ul style="list-style-type: none"> • NTFS is required. • For 64-bit, only x86-64 is supported. IA-64 (Itanium) is not supported. • 64-bit registry mirroring is supported only if you use a 64-bit agent/EFS (running on 64-bit Server 2008 R2) with 64-bit eMake (running on any 64-bit Windows platform). • To run eMake with Visual Studio on Windows, one of the following is required: <ul style="list-style-type: none"> • Visual Studio 2005 SP1 • Microsoft Visual C++ 2005 SP1 Redistributable Package (x64)
Windows Server 2008 R2 (64-bit only)	<ul style="list-style-type: none"> • NTFS is required. • For 64-bit, only x86-64 is supported. IA-64 (Itanium) is not supported. • 64-bit registry mirroring is supported only if you use a 64-bit agent/EFS (running on 64-bit Server 2008 R2) with 64-bit eMake (running on any 64-bit Windows platform). • To run eMake with Visual Studio on Windows, one of the following is required: <ul style="list-style-type: none"> • Visual Studio 2005 SP1 • Visual Studio 2005 SP1 Redistributable Package. Links are provided for your convenience: 32-bit 64-bit

Supported Solaris Platforms

Refer to the release notes for the latest updates to this information.

ElectricAccelerator Electric Make and Electric Agent/EFS run on:

Platform	Notes
Solaris 10 (SPARC and x86)	<ul style="list-style-type: none"> • Agent and eMake only, no Cluster Manager support starting with Accelerator v7.1 • Application is 32-bit only for Cluster Manager and eMake, and 64-bit only for agents. • For Solaris x86, eMake relies on several third-party open source libraries. The version of libxml2 that Electric Cloud builds in-house is different from the version that is available on SunFreeware.com. If you run eMake and get an error such as: <pre>ld.so.1: emake: fatal: libxml2.so.2: version `LIBXML2_2.7.6' not found (required by file /opt/eccloud/i686_SunOS.5.10/bin/emake) ld.so.1: emake: fatal: libxml2.so.2: open failed: No such file or directory</pre> then it is likely that your LD_LIBRARY_PATH environment variable contains a directory that includes a version of libxml2.so.2 that is incompatible with eMake. Unset LD_LIBRARY_PATH entirely to make eMake's rpath find all of its necessary libraries.

Supported Third-Party Build Tools

See [Supported Platforms and System Requirements](#) as well.

- GNU Make 3.79.1, 3.80, 3.81, and 3.82
- Microsoft NMAKE 7.x and 8.x
- SCons
- Symbian Make (Windows)
- Visual Studio: .NET 2002, .NET 2003, 2005, 2008, 2010, 2012, and 2013

The installer for Accelerator automatically installs the ElectricAccelerator Visual Studio Integration, which lets you build Visual Studio solutions and projects using eMake from within the IDE. For information about using this integration, see the *Visual Studio Integration Guide*.

Note: Accelerator can support Visual Studio 6 workspaces if they are exported to NMAKE files. However, every time something changes in the workspace, an export must be done again.

- Rational ClearCase 7.1.1, 7.1.2, and 8.0 (exceptions detailed below)

Note: ClearCase versions 7.1.2.9 and 8.0.0.5 contained a known missing lib issue. IBM fixed this issue in ClearCase versions 7.1.2.10 and 8.0.0.6 or 8.0.0.7. Electric Cloud recommends using one of those ClearCase versions with Accelerator.

Accelerator supports building within ClearCase dynamic views and provides the Ledger feature, which can track files that change as a result of a change to the view's configuration specification. (See the "ElectricAccelerator Ledger File" section in the "Dependency Management" chapter of the *ElectricAccelerator Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html.)

This version of Accelerator in GNU Make 3.81 emulation mode was tested against the following ClearCase environment:

ClearCase server
RHEL 4.6
ClearCase version 7.0.1 (Wed May 30 17:04:58 EDT 2007) @(#) MVFS version 7.0.1.0 (Wed Apr 11 21:19:21 2007) built at \$Date: 2008-10-24.19:30:48 (UTC) \$

ClearCase client
RHEL 5.6
ClearCase version 8.0.0.06 (Fri Mar 08 10:35:58 EST 2013) (8.0.0.06.00_2013A.D130307) @(#) MVFS version 8.0.0.6 (Thu Feb 21 05:02:58 2013) built at \$Date: 2013-02-21.10:13:08 (UTC) \$

ClearCase client
RHEL 5.6
ClearCase version 7.1.2.10 (Fri Mar 08 11:01:39 EST 2013) (7.1.2.10.00_2013A.D130307) @(#) MVFS version 7.1.2.10 (Thu Feb 21 00:53:03 2013) built at \$Date: 2013-05-16.22:01:13 (UTC) \$

Note: Accelerator does not currently support ClearCase integration on Solaris x86 platforms. If you need this support, contact your Electric Cloud sales representative. You can use `ecclearcase_fake.so` to provide information about your ClearCase setup through a `.ini` file. See the “eMake’s “Fake” interface for ClearCase” section in the “Third-Party Integrations” chapter of the *ElectricAccelerator Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html.

Hardware Requirements

Electric Cloud recommends installing the Cluster Manager, Electric Make, and Electric Agent components on independent machines, so that each component can run efficiently without competing for system resources.

The following are minimum hardware requirements for each machine where Accelerator components are installed (Electric Agent, Cluster Manager, and Electric Make).

- **Processor**—Pentium 4 (or a processor that supports Pentium 4 instructions) or SPARC
- **Installer disk space**—300 MB. Additional component disk space usage varies and depends on the size of your builds.

Electric Agent Machines

Agents use system memory to cache small or unmodified files. If your builds have increased in size substantially since the system was originally delivered, and you have noticed a slowdown in build times, consider upgrading the host hardware.

	Memory	Free Disk Space
Recommended	2 GB <i>per agent</i> 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.	At least 3-4 times the size of a complete build (input and output).
Minimum	1 GB <i>per agent</i> (machine minimum of 2 GB)	

Electric Make Machine

	Memory	Disk Space
Minimum	2 GB	Free disk space should be at least 200 MB or equal to the size of your largest build.

Cluster Manager Machine

	Memory	Disk Space
Minimum	2 GB (Windows) 4 GB (Linux)	5 GB (to allow space for build log storage)

Web Browser Requirements

To connect to the Cluster Manager, you must use one of the following web browsers.

Desktop Browsers

- Chrome 43 or newer
- Firefox 31.8 or newer
- Internet Explorer 10 or newer

Mobile Browsers

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

Port Usage

If you have an existing web server (for example, Apache or IIS) or other application that is already using port 80 on the Cluster Manager host, you have the following options:

- Uninstall the web server.
- Disable the web server.
- Reconfigure the web server to use another port.
- Choose a non-default port (not 80) for Apache during Cluster Manager installation. The default Apache SSL port is 443.

By default, the Cluster Manager server uses port 8030 and secure port 8031.

Toolchain

If you are not virtualizing your toolchain, you must install it on each agent. Software such as Norton Ghost might help mirror all agent hosts. For details, see the “Configuring Tools” section in the “Electric Make Basics” chapter of the *ElectricAccelerator Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html or (for Visual Studio users) the “Virtualizing the Visual Studio Toolchain” section in the “Using the ecdevenv Utility” chapter of the *Visual Studio Integration Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html.

Database Requirements

Accelerator supports the following databases:

- MySQL 5.5.16
- MariaDB 5.5.31
- Oracle Database 11g Release 2
- Oracle Database 12c
- MS SQL Server 2008

If you plan to use an Oracle or MS SQL database, you must create it before installing Accelerator.

Requirements for MySQL 5.5.16 on Linux

Libraries

If you want to run MySQL 5.5.16 on a Linux Cluster Manager, ***it must have the 32-bit version of the following libraries:***

- libaio.so.1
- libncurses.so.5

You might need to add those libraries to the Cluster Manager machine.

RHEL example using a package manager:

```
yum install libaio.i686
yum install ncurses-libs.i686
```

RHEL example without a package manager:

```
up2date --nox --arch=i386 libaio
up2date --nox --arch=i386 ncurses
```

Ubuntu example using a package manager:

```
apt-get install libaio
```


Oracle JDBC Connectors for the Cluster Manager

Electric Cloud does not distribute the JDBC drivers for MySQL or Oracle databases. If you use either database, the appropriate driver must be present in the `<ECloud install>/<arch>/lib/` directory on the Cluster Manager. After installing the Cluster Manager, you must download its driver directly from the Oracle website, copy it to that directory on the Cluster Manager server, and restart the Cluster Manager service. For details, see the “Installing JDBC Drivers for MySQL or Oracle Databases” section in Chapter 3, [Installing ElectricAccelerator](#).

Requirements for MariaDB on Linux

If you want to run MariaDB on a Linux Cluster Manager, **it must have the `libncurses.so.5` library**. You might need to add this library to the Cluster Manager machine.

Ubuntu example using a package manager:

```
apt-get install libation
```

Location Limitations

Electric Cloud does **not** support storing your database on Network Appliance systems or NFS.

Issues that you might encounter include the following:

- Accelerator is unable to start the database because the database attempts to lock files that are already locked.
- If the database starts, you might encounter issues related to the database's UTF-8 support.

Cygwin

These Cygwin versions have been validated by Electric Cloud:

Bitness	Cygwin Version
32-bit emake with 32-bit	Cygwin 2.3.0, 2.0.4, 1.7.9, 1.5.25
64-bit emake with 64-bit	Cygwin 2.3.0, 2.0.4

Install the same version of Cygwin on all agent hosts and eMake machines. Mixing different Cygwin versions (for example, running v1.5 on an eMake machine and v1.7 on agents) is not supported. (In particular, Cygwin versions 1.5 and 1.7 default to different incompatible representations for symbolic links.)

Note: Cygwin version 1.7.x is supported for x = 7 or 9 only. There are known problems for other versions of 1.7.x.

By default, Cygwin 1.7.7 applies overly restrictive permissions to most directories. The permissions prevent the Administrators group from creating new subdirectories and might prevent the agent software from creating new directories to serve as mount points in order to reflect eMake client mount points.

On all agent hosts modify the permissions for the Cygwin installation directory and any other directories under which you want the agent software to dynamically create Cygwin mount points. For agent installations that use standard `ECloudInternalUser*` accounts, grant the “Administrators” group permission to “create folders / append data.” For custom agent users, grant permission for subdirectory creation to those agent users.

Component Compatibility Matrix

In general, Electric Cloud tries to maintain compatibility between older versions of Electric Make and newer versions of the Cluster Manager and the Electric Agent. However, cross-version compatibility between other components is not ensured. Newer Electric Make version compatibility with older clusters is not ensured. The following matrix illustrates Electric Cloud’s compatibility philosophy:

	Newer Electric Agent	Older Electric Agent	Newer Cluster Manager	Older Cluster Manager	Newer Electric Make	Older Electric Make
Electric Make	Yes	No	Yes	No	No	No
Electric Agent	N/A	N/A	No	No	No	Yes
Cluster Manager	No	No	N/A	N/A	No	Yes

Electric Make and the Electric Agent use a custom protocol to communicate with each other. Electric Cloud evolves this protocol in a backwards compatible manner so older Electric Make versions are compatible with newer Electric Agent versions. This means you can upgrade the cluster anytime you want, then upgrade Electric Make installations at your leisure.

Electric Make also uses a custom protocol to communicate with remote instances of itself, for example, during remote parse jobs. This protocol is less tolerant than the Electric Make/Agent protocol. In general, it is best to have the same version of Electric Make on the cluster as you have on your build machine—Electric Cloud simplifies this because old versions of Electric Make are preserved on the cluster whenever the cluster is upgraded. For example, if your cluster originally had version 7.x installed and was upgraded to 8.x, the 7.x Electric Make version remains on the cluster—in a special directory in the install tree. You do not have to do anything to ensure this version is used when you run a build using a 7.x Electric Make version (the system handles that for you).

Note: Old versions are *not* installed! What is already there during upgrades is preserved. So, if you install 8.0 on a fresh agent machine, you will *not* be able to use a 7.2 Electric Make with that agent unless you obtain archives of that earlier eMake version from the Electric Cloud FTP site. See [Installing the Backward-Compatibility Package on Agent Machines](#).

Electric Make and the Cluster Manager use yet another protocol to communicate with each other. Again, Electric Cloud evolves this protocol so old Electric Make versions can work with newer Cluster Managers. For example, you should have no problem using a 7.x Electric Make version with an 8.x Cluster Manager.

Finally, the Electric Agent uses a custom protocol to communicate with the Cluster Manager. Electric Cloud does not try to maintain compatibility between these two components—generally, if the agent version is “close” to the Cluster Manager version, it is compatible. However, you cannot use 8.x agents with a 7.x Cluster Manager or vice-versa.

Ensuring a Consistent Build Environment

If any tools (such as compilers) are installed locally, you must ensure that they are all the same version on all agent host machines and kept in sync. Also, to avoid problems, all agent host machines should use the same operating system. Finally, for predictable performance, you should consider using a homogeneous cluster (that is, identical hardware for all agent host machines in the same cluster).

Note: Ghosting with agents already installed is not recommended.

Electric Cloud also recommends that all hosts in a cluster have synchronized clocks. This is important, particularly if you are running in the “shared” agent allocation policy.

- For Linux or UNIX machines, you can use utilities such as ntpdate or a combination of ntpd and sntp to synchronize clocks. For more information, see <http://www.ntp.org/>.
- For Windows machines, participation in a domain generally ensures synchronized clocks. You can also use the W32Time Time Service tool and the w32tm system utility to synchronize clocks. For more information, see [Microsoft TechNet article "Windows Time Service Tools and Settings"](#) and Microsoft Fix it 50395 in [Microsoft KB article 816042 "How to configure an authoritative time server in Windows Server."](#)

Planning for Grid Use

If you plan to use a host grid with Accelerator, here is a planning checklist:

- Choose a machine for the Cluster Manager.

This machine will use the grid as any other client-only host. If you are upgrading an existing Cluster Manager, you must install the grid client-only product—and ensure it is 32-bit only.

IMPORTANT: A Solaris x86 Cluster Manager cannot integrate with LSF.

- Choose hosts within the grid to run your builds.

In general, these are machines you already use for software builds. Accelerator will use these machines in parallel to run builds, but machine availability is controlled by the grid management software. Electric Make allows you to select a subset of these machines using grid resource query strings. For details about the `emake --emake-resource` option, see the “Electric Make Command-Line Options and Environment Variables” section in the “Electric Make Basics” chapter of the *ElectricAccelerator Electric Make User Guide* at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html.

- Choose hosts for Electric Make.

If you will be running Electric Make within the grid, you must install Electric Make on those hosts.

- Select or create a user ID to run the Cluster Manager.

IMPORTANT: This user ID must be set up with appropriate permissions and able to execute grid commands.

Note: If this is a UNIX user ID, you might need to run, for example, “`profile.lsf`” in your shell startup script.

If this is a Windows user ID, you might need to do the following:

1. Go to Services. (The process might vary depending on your Windows version.)
2. Right-click the ElectricAccelerator Cluster Manager service and go to Properties.
3. Click the Log On tab.
4. Select This account (Local System account would normally be selected).
5. Type in the user ID and password for the user account.

- Select a queue for Accelerator.

This queue must be allowed to submit jobs that request exclusive host use (`bsub -x` option) or a queue that specifies `HJOB_LIMIT=1`. Set up the queue so jobs can be submitted on any platform where you intend to use Electric Make. For example, if your software builds are on Linux and Windows, the queue must allow jobs on either platform.

For additional information, see:

- [Enabling Grid Host Manager](#)
- [Configuring LSF](#)

Checksum Utility

An MD5 checksum file is available on the Electric Cloud FTP site. If you choose to verify that the install files are intact and unaltered from their original form and content after you download them, download the corresponding MD5 checksum file also.

MD5 utilities are available for supported operating systems.

- On Linux, verify with `md5sum --check md5.txt`
- Most Linux installations provide an `md5sum` command for calculating MD5 message digests.
- An MD5 utility for Windows can be downloaded at <http://www.fourmilab.ch/md5/>.

Chapter 3: Installing ElectricAccelerator

You can install the software using a GUI, a "silent" installer, or (on Linux and Solaris) an interactive command-line interface. Not all instructions are the same for each platform. Follow the instructions carefully for your platform. Read the procedures thoroughly before attempting to install, configure, or uninstall any component.

- [Before You Install ElectricAccelerator](#)
- [Installing ElectricAccelerator on Linux or Solaris](#)
- [Installing ElectricAccelerator on Windows](#)
- [Performing a Silent Installation](#)
- [Additional Installation Options](#)
- [Installing JDBC Drivers for MySQL or Oracle Databases](#)
- [Migrating an eMake-Only Installation to a Different Machine](#)
- [Installing the Backward-Compatibility Package on Agent Machines](#)

Before You Install ElectricAccelerator

Cluster Manager and Agent Installation Location Limitations

Electric Cloud does not support installation of the Cluster Manager or agents on the following:

- NFS
- CIFS
- Samba shares

32-Bit Versus 64-Bit Versions

- On Windows and Linux, the installer file always installs both the 32-bit and 64-bit versions of eMake. On Solaris, it installs only 32-bit.
- 64-bit executables are installed in a subdirectory of the installation location, `<InstallDir>/64/bin`.
 - For example, on Windows, if you install into the Windows C:\ECloud directory, the 64-bit executables are in the C:\ECloud\i686_win32\64\bin directory.
 - For example, on Linux, if you install into the /opt/ecloud directory, the 64-bit executables are in the /opt/ecloud/i686_Linux/64/bin directory.
- The agent installer automatically determines whether to install the 32-bit or 64-bit agents based on the machine architecture. No user action is required.
- The Accelerator installer automatically sets the path to 32-bit. To use 64-bit, you must edit the environment variable path to include the 64-bit bin location before the 32-bit location.

Installation Log File

The installation log file is in the installation directory's root by default.

Installing ElectricAccelerator on Linux or Solaris

IMPORTANT: Installing a component overwrites the entire installation on that machine. Only one Accelerator installation can exist on a machine, which is the combination of components that are in the most recent installation. For example, installing the Cluster Manager on a machine with the Electric Agent results in a machine with the Cluster Manager only, not a machine with the Electric Agent and the Cluster Manager.

- [Additional Linux Installation Information](#)
- [Installing the Cluster Manager](#)
- [Installing Agent/EFS](#)
- [Installing Electric Make](#)
- [Path Settings](#)
- [Silent Installation](#)
- [Additional Installation Options](#)

Additional Linux or Solaris Installation Information

Antivirus Software

Some antivirus software might affect the installer. Turn antivirus software off during installation. If antivirus

software is running when you start the installer, you might receive an error dialog. The antivirus software might have reported Accelerator files as a virus and removed them from the temp location. As a workaround, turn off the antivirus software and rerun the installer.

If Symantec AntiVirus software is installed, disable it before installation to avoid serious file system conflicts. If Symantec AntiVirus cannot be disabled, put the ECloud directory in an exclusion list or disable the AutoProtect feature. If you need more information, contact Electric Cloud technical support. For contact information, see <http://electric-cloud.com/support>.

umask

Electric Cloud recommends umask 0022. Do not set a different umask during installation.

Absolute Path for Solaris

On Solaris systems, you must use an absolute path for the installation directory.

mysqlcheck

By default, mysqlcheck looks for my.cnf in /etc and ~/.my.cnf for configuration information. The installer does not currently copy my.cnf to /etc, causing mysqlcheck to fail. You must add the following to the mysqlcheck command line parameter: `--defaults-file=<path to my.cnf>`

For example: `mysqlcheck --defaults-file=/opt/ecloud/i686_Linux/mysql/my.cnf -o ecloud`

LOFS and Global System Named Pipes

Because of a limitation of the Linux operating system, global system named pipes are not compatible with LOFS. To work around this limitation, you must add the directory containing each named pipe that is used by your builds to the list of bind mounts.

On each agent machine, complete the following steps.

1. Log in as root.
2. Create an `/opt/ecloud/i686_Linux/bin/runagent.local` file and add the following lines to that file:

```
set tmpBindmounts [sandbox bindmounts]
lappend tmpBindmounts <list of absolute paths to named pipes>
sandbox bindmounts [lsort -unique $tmpBindmounts]
```
3. Restart the machine.

This procedure adds the new location to the list of bind mounts in a way that is preserved across upgrades. Note that LOFS supports creating “local” (used by a single job) named pipes.

Installing the Cluster Manager

Note: Starting with version 7.1, you cannot install the Cluster Manager on Solaris systems.

The Cluster Manager is a web server and can be installed on any networked machine with access to Electric Make and the cluster hosts, or on the main build machine where Electric Make is installed.

Install only one copy of the Cluster Manager, regardless of the number of hosts in the cluster or the number of machines with Electric Make installed. Electric Make is installed with the Cluster Manager by default.

If you are upgrading a previously installed ElectricAccelerator version, follow the upgrade instructions *before* attempting to install the new version.

Note: Electric Cloud no longer bundles MySQL as the default local database for ElectricAccelerator. Starting with version 7.1, Electric Cloud bundles MariaDB and installs it as the default local database on the Cluster Manager. When you perform a Cluster Manager upgrade, 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. As open-source software, there is no enterprise license support model available with MariaDB. If using an open-source database is of concern to your organization, you continue to have the option to use any of the following databases as a replacement: MySQL, Oracle, or SQL Server. See the online help topic "Database Configuration" for information about configuring Accelerator to use an external database.

You can install the Cluster Manager and agents at the same time on the same machine.

Using the GUI to Install the Cluster Manager

1. Log in as root.
2. Double-click the `ElectricAccelerator-<version>-<platform>-Install` installer file.

The installation packages might need a few minutes to extract.
3. When the **Welcome** screen appears, click **Next**.
4. On the **Setup Type** screen, select **Cluster Manager** (Electric Make also installs automatically with the Cluster Manager) and click **Next**.
5. On the **Choose Destination Location** screen, accept the default installation directory or browse to select an alternative directory.

Notes:

- Avoid selecting an alternative directory that includes spaces in the name. Spaces can create problems when configuring connections with other command-line-based components.
- If you plan to install Electric Make in a non-default location, use the same location on all agent hosts and on the Cluster Manager host.

Click **Next**.

6. On the **Base Setup** screen, choose whether you want to install Electric Runner client applications (which enable you to run Accelerator administration tools) and click **Next**.
7. On the **Cluster Manager** screen, enter Cluster Manager configuration options:
 - Accept the default ports or type in alternative port numbers if the defaults are already in use. For example, IIS and Apache also use port 80 by default.
 - Accept the default to keep old log files or select the checkbox to remove old log files.
 - Accept the default (checked checkbox) to leave web server log rotation turned on or clear the checkbox to turn off log rotation. **IMPORTANT:** Log rotation might affect Cluster Manager performance.
 - Select the type of database to use.

Note: If you do not use MariaDB, the database must already exist and you must be able to connect to it. The installer does *not* validate database connections.

Click **Next**.

9. On the next **Cluster Manager** screen, continue to enter Cluster Manager configuration options:
 - You can change the Cluster Manager `admin` password or accept the default password (`changeme`).
 - You do not need to migrate the existing database or back up the local database if this is your first Cluster Manager installation.

- Fill in the user name or choose a user that the Cluster Manager service should run as or leave blank. Choose a password for the Cluster Manager service user or leave blank.

Note: If you plan to use a host grid, the user selected for the Cluster Manager Service User must be fully enabled to start and stop grid jobs.

Click **Next**.

10. On the **Cluster Manager Database** screen, type in the Cluster Manager database port number. For MS SQL, use port 1433.

If you did not select MariaDB as your database type, the following additional fields are available:

- **Database Host/IP Address**
- **Database User**
- **Database Password**
- **Database Name (IMPORTANT: Do *not* use a . (period) in the database name. A period in the name will prevent the Cluster Manager from starting.)**

Click **Next**.

11. When the **Start Copying Files** screen appears, click **Next**.
12. The **Installing** screen displays while the installation proceeds. When installation is finished, the **Complete** screen displays. Click **Finish**.

Installation is complete. The installation log file is in the install directory's root by default.

Note: If Apache fails to start properly after the Cluster Manager installs, reboot the system.

Using the Interactive Command Line to Install the Cluster Manager

1. Log in as root.
2. Run `chmod +x` on the `ElectricAccelerator-<version>-<platform>-Install` installer file to ensure it is executable.
3. Run `./<installer filename> --mode console` to start the installation.

The installer displays:

```
This will install ElectricAccelerator version <version> on your computer.
```

```
For information about software configuration and licensing, see the ElectricAccelerator Installation and Configuration Guide.
```

```
Enter y to continue or n to exit the installer. [n/Y]
```

4. Continue the installation by entering `y`.

The installer displays:

```
Welcome to the ElectricAccelerator installer <version>
  Build: <version>
```

```
=====
This installer can install the following packages:
```

- ```
1 - Electric Agent/EFS
 Installs Electric Agent/EFS and Electric Make.
2 - Electric Make
```

```
 Installs Electric Make.
3 - Cluster Manager
 Installs Cluster Manager and Electric Make.
4 - Cluster Manager and Electric Agent
 Installs Cluster Manager, Electric Make and Electric Agent/EFS on same
host.
Select a package to install by entering the corresponding number: [2]
```

5. Enter 3 to select the Cluster Manager package and press Enter.

Provide the following Cluster Manager configuration information. You can accept the defaults or type in alternatives.

```
Where do you want to install ElectricAccelerator? [opt/ecloud]
Setup was unable to locate a PDF reader. To view the included documentation ente
r the path to a PDF reader []
Install Electric Runner client apps? [n/Y]
Cluster Manager HTTP port: [80]
Cluster Manager HTTPS port: [443]
Cluster Manager Accelerator Server port: [8030]
Cluster Manager Secure Accelerator Server port: [8031]
Remove Cluster Manager old logs [y/N]
Rotate Cluster Manager logs [y/N]
Database Type: [MariaDB]
Cluster Manager Service User: [eacmuser]
Cluster Manager Admin Password: [changeme]
Migrate existing database [n/Y]
Back up local MariaDB database [y/N]
Database Port: [3306]
Database Host/IP address: [localhost]
Database User: [ecloud]
Database Password: [ecloud]
Database Name: [ecloud]
```

**Note:**

- Turning on log rotation might affect Cluster Manager performance.
- If you plan to use a host grid, the user selected for the Cluster Manager Service User must be fully enabled to start and stop grid jobs.

**IMPORTANT:** Do not use a . (period) in the database name. A period in the name will prevent the Cluster Manager from starting.

The installer installs Cluster Manager using the configuration details you entered, followed by Installation complete when the install completes.

The installation log file is in the install directory's root, /opt/ecloud by default.

**Note:** Linux operating systems contain a 1024 default file descriptor limit for each process. However, this does not mean 1024 builds can be run concurrently. Depending on the size of your builds, you might be able to run only 300–400 builds concurrently because of other file descriptor activity and the collection activity between eMake and the Cluster Manager. If you must run more than 300–400 builds simultaneously, increase the default file descriptor limit.

If Apache fails to start properly after a fresh Cluster Manager install, reboot the system.

## Installing Electric Agent/EFS

Electric Agent/EFS software must be installed on each machine in the cluster. Electric File System (EFS) and the Electric Agent are installed simultaneously on each host machine during Electric Agent/EFS installation.

Multiple instances of Electric Agent/EFS pairs can be set up to run in parallel on a host. For example, if you have a multiprocessor machine, you might want to set up an Electric Agent for each processor. More information on running multiple agents is available in the ElectricAccelerator online help.

If you are upgrading a previously-installed ElectricAccelerator version, follow the upgrade instructions *before* attempting to install the new version.

Your tool chain should be installed on each agent host. You can virtualize the tool chain in some cases, but this can be problematic especially when the Windows registry is involved. For performance reasons, you should install the tool chain on each agent host. Many companies use “ghosting” software for this purpose.

**IMPORTANT:** “Ghosting” with the Electric Agent already installed is not recommended.

## Installing Electric Agent/EFS in a Grid Environment

You must install the Electric Agent/EFS on each machine in the grid that ElectricAccelerator will use. The actual installation process for the Electric Agent/EFS is the same whether or not you use a grid *except* that you must answer “yes” (**y**) to any prompt that asks whether you plan to use a grid environment, such as LSF.

**Note:** After the Electric Agent/EFS is installed, it remains dormant until the grid management software schedules an agent connect script to run on that host.

You can install the Cluster Manager and agents at the same time on the same machine.

**Note:** Agent/EFS builds a kernel module during installation, so you might need to take this into consideration.

### Using the GUI to install Electric Agent/EFS

1. Log in as root.
2. Double-click the `ElectricAccelerator-<version>-<platform>-Install` installer file.

The installation packages might need a few minutes to extract.

3. When the **Welcome** screen appears, click **Next** to continue to the **Setup Type** screen.
4. On the **Setup Type** screen, select **Electric Agent**, and click **Next**.
5. On the **Choose Destination Location** screen, accept the default installation directory or browse to select an alternative directory.

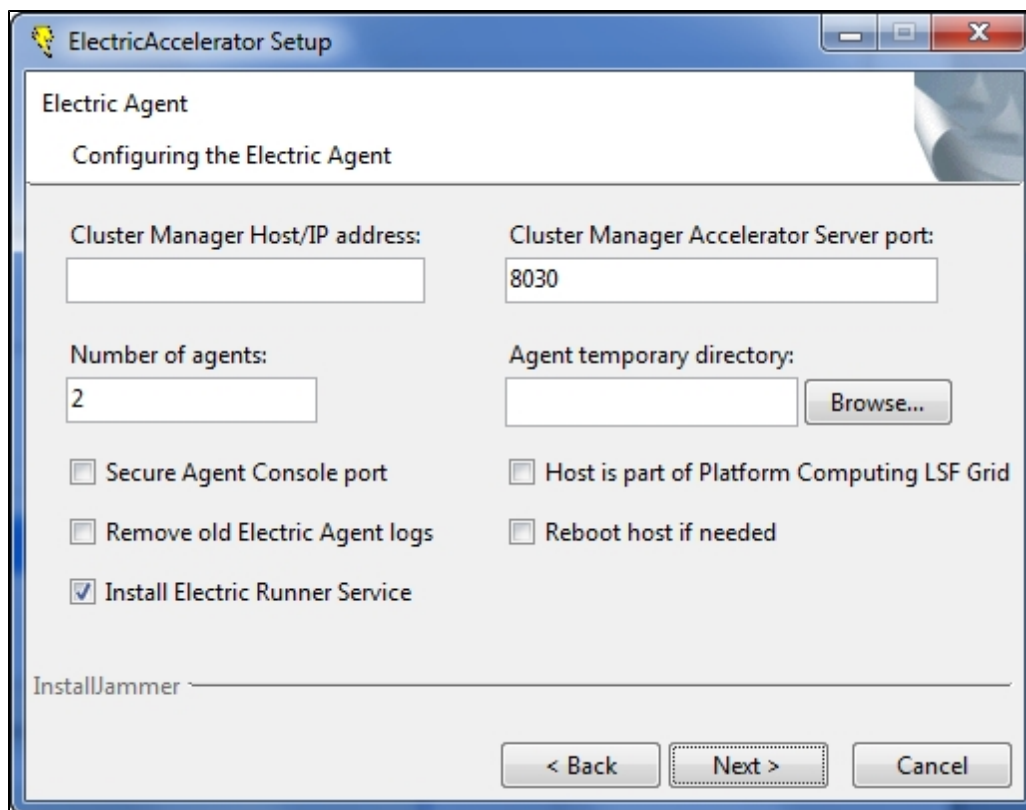
**Note:** Do not select an alternative directory that includes spaces in the name. Spaces can create problems when configuring connections with other command-line-based components.

Click **Next**.

6. On the **Base Setup** screen, choose whether you want to install Electric Runner (eRunner) client applications, and click **Next**.
7. On the **Electric Agent** screen, enter options for the locally installed Electric Agent/EFS.

- Type in the Cluster Manager host name or IP address.
- Accept the default Cluster Manager port 8030 or type in the alternative port that you supplied during the Cluster Manager server installation.
- Enter the number of agents to run. The installer calculates the default number of agents based on the effective number of CPUs on the machine. Default=1, if one CPU is present. If more than one CPU is present, the default value is the number of effective CPUs. The maximum number of agents allowed on one 32-bit machine is 32; the maximum for one 64-bit machine is 64.
- Accept the default agent temporary directory, or choose an alternative. On Linux or Solaris, this directory must not be a symbolic link.
- Accept the default for the **Secure Agent Console Port** checkbox if you will not use the secure port, or select the checkbox if you want to use the secure port.
- If this agent machine is part of the grid, select the **Host is part of Platform Computing LSF Grid** checkbox. (For this field, “LSF” refers to all grid engines.)
- (Optional) Select the **Remove old Electric Agent logs** checkbox.
- (Optional) Select the **Reboot host if needed** checkbox.
- (Optional) Select the **Install Electric Runner Service** checkbox.

**Note:** eRunner is a “helper” service normally installed on all agent machines. This service listens for commands to execute on agents, facilitating administration tasks. For example, with eRunner you can upgrade all agents at the same time, remotely.



The screenshot shows the 'ElectricAccelerator Setup' window with the 'Electric Agent' tab selected. The window title is 'ElectricAccelerator Setup'. The subtitle is 'Configuring the Electric Agent'. The main area contains several configuration fields and checkboxes:

- Cluster Manager Host/IP address:** An empty text box.
- Cluster Manager Accelerator Server port:** A text box containing '8030'.
- Number of agents:** A text box containing '2'.
- Agent temporary directory:** An empty text box with a 'Browse...' button to its right.
- Secure Agent Console port:** An unchecked checkbox.
- Host is part of Platform Computing LSF Grid:** An unchecked checkbox.
- Remove old Electric Agent logs:** An unchecked checkbox.
- Reboot host if needed:** An unchecked checkbox.
- Install Electric Runner Service:** A checked checkbox.

At the bottom of the window, there is a progress bar labeled 'InstallJammer' and three buttons: '< Back', 'Next >', and 'Cancel'.

Click **Next**.

8. (Windows only) Select the user accounts you will use to run agents. Accept the default ECloud internal user or select **Existing User**. If you select **Existing User**, click **Add User** to add a user account. Then click **Next**.
9. On the **Electric Runner Server** screen, enter options for the Electric Runner server.
  - Accept the default Electric Runner Server port or type in an alternative.
  - Accept the default to leave old Electric Runner logs or select the checkbox to remove old logs.
 Click **Next**.
11. When the **Start Copying Files** screen appears, click **Next**.
12. The **Installing** screen displays while the installation proceeds. When installation is finished, the **Complete** screen displays. Click **Finish**.

Installation is complete. The installation log file is in the install directory's root by default.

### *Using the Interactive Command Line to Install Electric Agent/EFS*

1. Log in as root.
2. Run `chmod +x` on the `ElectricAccelerator-<version>-<platform>-Install` installer file to ensure it is executable.
3. Run `./<installer filename> --mode console` to start the installation.

The installer displays:

```
This will install ElectricAccelerator version <version> on your computer.
```

```
For information about software configuration and licensing, see the ElectricAccelerator Installation and Configuration Guide.
```

```
Enter y to continue or n to exit the installer. [n/Y]
```

4. Continue the installation by entering `y`.

The installer displays:

```
Welcome to the ElectricAccelerator installer <version>
Build: <version>
```

```
=====
```

```
This installer can install the following packages:
```

```
1 - Electric Agent/EFS
 Installs Electric Agent/EFS and Electric Make.
2 - Electric Make
 Installs Electric Make.
3 - Cluster Manager
 Installs Cluster Manager and Electric Make.
4 - Cluster Manager and Electric Agent
 Installs Cluster Manager, Electric Make and Electric Agent/EFS on same
 host.
Select a package to install by entering the corresponding number: [2]
```

5. Enter `1` to select the Electric Agent/EFS package and press **Enter**.

The installer displays:

```
Where do you want to install ElectricAccelerator? [opt/ecloud]
```

6. Accept the default location or type in an alternative location.

If the installer cannot locate a PDF view, it displays:

```
Setup was unable to locate a PDF reader. To view the included documentation ente
r the path to a PDF reader []
```

7. Provide a path or press **Enter** to skip.

The installer displays:

```
Install Electric Runner client apps [n/Y]
```

8. Decide if you want to install eRunner client apps. eRunner is a “helper” daemon normally installed on all agent machines. This daemon listens for commands to execute on agents, facilitating administration tasks. For example, with eRunner you can upgrade all agents at the same time, remotely. Make your selection and press **Enter** to continue.

The installer displays:

```
Host is part of Platform Computing LSF Grid [y/N]
```

9. Make your selection for host grid usage and press **Enter**. (The term “LSF” refers to all grid engines.) In a grid environment, such as LSF, agents are not bound to a Cluster Manager during installation. Instead, the grid management software tells the agents which Cluster Manager to talk to—which means the Cluster Manager host name or port number you might have specified will not be used.

The installer displays:

```
Cluster Manager Host/IP address:
```

10. Provide the Cluster Manager host/IP address and press **Enter**.

The installer displays:

```
Cluster Manager Accelerator Server port: [8030]
```

11. Use the Cluster Manager default server listening port 8030, or type in the alternative port if you did not accept the default when you installed Cluster Manager.

The installer displays:

```
Number of agents: []
```

12. Use the default or type in a different number of agents to install. The installer calculates the default number of agents based on the number of effective CPUs on the machine. For example, you might have one agent per virtual CPU, a single dual-core CPU supports two agents, three dual-cores support six agents. The maximum number of agents allowed on one 32-bit machine is 32; the maximum for one 64-bit machine is 64.

The installer displays:

```
Agent temporary directory: [/tmp]
```

13. Accept the default agent temporary directory or specify a different directory. If you specify a different directory, it must already exist, otherwise the temporary directory defaults to `/tmp`. The agent temporary directory must not be a symbolic link.

The installer displays:

```
Secure Agent Console port [y/N]
```

14. Decide if you want to use a secure agent console port and press **Enter**.

The installer displays:

```
Remove old Electric Agent logs [y/N]
```

15. Choose whether to remove old agent logs and press **Enter**.

The installer displays:

```
Reboot host if needed [y/N]
```

16. Decide whether to reboot the host if needed and press **Enter**.

The installer displays:

```
Install Electric Runner Service [n/Y]
```

17. Decide if you want to install the eRunner service and press **Enter**. eRunner is a “helper” service normally installed on all agent machines. This service listens for commands to execute on agents, facilitating administration tasks.

The installer displays:

```
Electric Runner Server port: [2411]
```

18. Use the default eRunner port to type in an alternate port and press **Enter**.

The installer displays:

```
Remove old Electric Runner logs [y/N]
```

19. Decide if you want to remove old eRunner logs and press **Enter**.

The installer installs the Electric Agent/EFS using the configuration details you provided, followed by “Installation complete” when the install completes.

The installation log file is in the install directory’s root, `/opt/eccloud` by default.

## Installing eMake

eMake can be installed on a networked machine or on a shared file server accessible to other build machines. Wherever eMake is installed, it must have access to the Cluster Manager machine and agents on the cluster host machines. If you are upgrading a previously installed ElectricAccelerator version, follow the upgrade instructions *before* attempting to install the new version.

**Note:** An eMake-only installer is available, which lets you streamline eMake client installation.

After eMake is installed, you must configure eMake for your build environment and enable communication with the Cluster Manager. For details, see the “Setting Up ElectricAccelerator” chapter of the *ElectricAccelerator Electric Make User Guide* at [http://docs.electric-cloud.com/accelerator\\_doc/AcceleratorIndex.html](http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html).

You can install the Cluster Manager and agents at the same time on the same machine.

### Using the GUI to Install eMake

1. Log in as root.
2. Double-click the `ElectricAccelerator-<version>-<platform>-Install` installer file to start installation.

**Note:** Extracting the installation packages to your machine might take several minutes before the installation wizard appears.

3. When the **Welcome** screen appears, click **Next**.
4. On the **Setup Type** screen, select **Electric Make**, and click **Next**.

5. On the **Choose Destination Location** screen, accept the default installation directory or browse to select an alternative directory. Ensure the Electric Make path matches the path used for the installed Electric Agent.

**Note:** Do not choose an alternative directory that includes spaces in the name. Spaces can create problems when configuring connections with other command-line-based components.

An error appears if you do not have permission to write to the alternative directory. If this occurs, you must either acquire permission or exit the installer, then log in as root, and then restart the installation.

Click **Next**.

6. On the **Base Setup** screen, choose whether you want to install Electric Runner client applications. eRunner is a “helper” daemon normally installed on all agent machines. This daemon listens for commands to execute on agents, facilitating administration tasks. For example, with eRunner you can upgrade all agents at the same time, remotely. Make your selection and click **Next**.
7. If the machine already has Electric Make installed *and* you chose to install this version of eMake in a different location, you can allow multiple eMake installations on the same machine. If you don't allow this, the previous version of eMake will be uninstalled. Choose your option and click **Next**.
8. When the **Start Copying Files** screen appears, click **Next**.
9. The **Installing** screen displays while the installation proceeds. When installation is finished, the **Complete** screen displays. Click **Finish**.

Installation is complete. The installation log file is in the install directory's root, by default.

### *Using the Interactive Command Line to Install eMake*

1. Log in as root.
2. Run `chmod +x` on the `ElectricAccelerator-<version>-<platform>-Install` installer file to ensure it is executable.
3. Run `./<installer filename> --mode console` to start the installation.

The installer displays:

```
This will install ElectricAccelerator version <version> on your computer.
```

```
For information about software configuration and licensing, see the ElectricAccelerator Installation and Configuration Guide.
```

```
Enter y to continue or n to exit the installer. [n/Y]
```

4. Continue the installation by entering `y`.

The installer displays:

```
Welcome to the ElectricAccelerator installer <version>
Build: <version>
```

```
=====
This installer can install the following packages:
```

- 1 - Electric Agent/EFS  
Installs Electric Agent/EFS and Electric Make.
- 2 - Electric Make  
Installs Electric Make.
- 3 - Cluster Manager  
Installs Cluster Manager and Electric Make.



- 4 - Cluster Manager and Electric Agent  
Installs Cluster Manager, Electric Make and Electric Agent/EFS on same host.  
Select a package to install by entering the corresponding number: [2]
5. Enter 2 to select the Electric Make package and then press Enter.
- The installer displays:
- Where do you want to install ElectricAccelerator? [opt/ecloud]
6. Accept the default location or type in an alternative location.
- If you install eMake in a non-default location, ensure that the same location is used for all agent hosts and the Cluster Manager host.
- An error appears if you do not have permission to write to the alternative directory. If this occurs, you must either acquire permission or exit the installer, then log in as root, and then restart the installation.
- If the installer cannot locate a PDF view, it displays:
- Setup was unable to locate a PDF reader. To view the included documentation enter the path to a PDF reader []
7. Provide a path or press Enter to skip.
- The installer displays:
- Install Electric Runner client apps [n/Y]
8. Decide if you want to install eRunner client apps. eRunner is a “helper” daemon normally installed on all agent machines.
- This daemon listens for commands to execute on agents, facilitating administration tasks. For example, with eRunner you can upgrade all agents at the same time, remotely. Make your selection and press Enter to continue.
- If the machine already has eMake installed *and* you chose to install this version of eMake in a different location, you have the option to allow multiple eMake installations on the same machine. If you don't allow this, the previous version of eMake will be uninstalled.
- If the above conditions are true, the installer displays:
- Allow multiple EMake installs in separate directories [y/N]
- The installer installs eMake using the configuration details you provided, followed by Installation complete when the install completes.

The installation log file is in the install directory's root, /opt/ecloud by default.

## Path Settings

All ElectricAccelerator components are installed in the /opt/ecloud directory by default.

Scripts to add the necessary environment variables are installed in /opt/ecloud/<arch>/conf. <arch> is:

- i686\_Linux for Linux
- sun4u\_SunOS for Solaris SPARC or i686\_SunOS.5.10 for Solaris x86

The scripts are named ecloud.bash.profile (for bash shells) or ecloud.csh.profile (for c shells). You can source the appropriate file in your shell to ensure your PATH includes Accelerator libraries.

## Installing ElectricAccelerator on Windows

**IMPORTANT:** Installing a component overwrites the entire installation on that machine. Only one Accelerator installation can exist on a machine, which is the combination of components that are in the most recent installation. For example, installing the Cluster Manager on a machine with the Electric Agent results in a machine with the Cluster Manager only, not a machine with the Electric Agent and the Cluster Manager.

- [Additional Windows Installation Information](#)
- [Installing the Cluster Manager](#)
- [Installing Electric Agent/EFS](#)
- [Installing Electric Make](#)
- [Silent Install](#)
- [Additional Install Options](#)

## Additional Windows Installation Information

### Installer Activity

- The installer automatically takes the following actions (where applicable to your Windows version):
  - Disables the Windows error reporting service
  - Sets HKLM\SYSTEM\CurrentControlSet\Control\FileSystem\NtfsDisableLastAccessUpdate to 0. The default value for Windows Server 2008 R2 is 1
  - Disables User Account Control (UAC) for 64-bit versions. Disabling UAC avoids popup windows for applications that require administrator privileges. If UAC is enabled, application registry access is redirected to each user's virtual store, even if it runs under the Administrator account
- If you invoke the installer from a network drive, an Unknown Publisher security warning might appear. You can disregard this warning and proceed with installation.

### Installing from the Cygwin Shell

If you run the installer from the Cygwin shell, be advised of the following:

- Before running the installer, disable UAC, or start the Cygwin shell using the Run as Administrator menu item (right-click the Cygwin desktop icon). Running the installer with UAC enabled might result in a "permission denied" error. This is applicable for all Windows versions that use UAC (Windows 7 and Windows Server 2008 R2).
- You might encounter issues when running the installer from the Cygwin `/tmp` directory. Electric Cloud recommends running the installer from a different directory. This is applicable for all Windows versions.

### Antivirus Software

Some antivirus software might affect the installer. Turn antivirus software off during installation. If antivirus software is running when you start the installer, you might receive an error dialog. The antivirus software might have reported Accelerator files as a virus and removed them from the temp location. As a workaround, turn off the antivirus software and rerun the installer.

If Symantec AntiVirus software is installed, disable it before installation to avoid serious file system conflicts. If Symantec AntiVirus cannot be disabled, put the ECloud directory in an exclusion list or disable the

AutoProtect feature. If you need more information, contact Electric Cloud technical support. For contact information, see <http://electric-cloud.com/support>.

## Installing from a Network Drive

If you invoke the installer from a network drive, you might receive an Unknown Publisher security warning. You can disregard this warning and proceed with installation.

## mysqlcheck

By default, mysqlcheck looks for my.cnf in /etc and ~/.my.cnf for configuration information. The installer does not currently copy my.cnf to /etc, causing mysqlcheck to fail. You must add the following to the mysqlcheck command line parameter: `--defaults-file=<path to my.cnf>`

For example: `mysqlcheck --defaults-file=/opt/ecloud/i686_Linux/mysql/my.cnf -o ecloud`

## Installing the Cluster Manager

The Cluster Manager is a web server and can be installed on any networked machine with access to Electric Make and the cluster hosts, or on the main build machine where Electric Make is installed.

Install only one copy of the Cluster Manager, regardless of the number of hosts in the cluster or the number of machines with Electric Make installed. Electric Make is installed with the Cluster Manager by default.

If you are upgrading a previously installed ElectricAccelerator version, follow the upgrade instructions *before* attempting to install the new version.

**Note:** Electric Cloud no longer bundles MySQL as the default local database for ElectricAccelerator. Starting with version 7.1, Electric Cloud bundles MariaDB and installs it as the default local database on the Cluster Manager. When you perform a Cluster Manager upgrade, 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. As open-source software, there is no enterprise license support model available with MariaDB. If using an open-source database is of concern to your organization, you continue to have the option to use any of the following databases as a replacement: MySQL, Oracle, or SQL Server. See the online help topic “Database Configuration” for information about configuring Accelerator to use an external database.

**Note:** On Windows Server 2008 R2, you might encounter a “Not Responding” error during install. Electric Cloud recommends waiting for up to 10 minutes for the install to continue normally.

You can install the Cluster Manager and agents at the same time on the same machine.

## Installation Procedure

1. Log in as Administrator. (You must be a member of the Administrator group—Administrator privileges are not sufficient.) If you are running *rdp* on the Cluster Manager server, ensure that *rdp* is in installation mode: `change user/install`.
2. Double-click the `ElectricAccelerator-<version>-<platform>-Install` installer file. (For Windows Server 2008 or later, the administrator user must right-click the file and select **Run as administrator**.)

### Notes:

- The installation packages might need a few minutes to extract.
- If a security alert pop-up appears, click **unblock** and continue.
- ElectricAccelerator requires the Microsoft Visual C++ 2005 SP1 Redistributable. If it is already installed, select the checkbox.

Click **Next** to continue.

3. When the **Welcome** screen appears, click **Next**.
4. On the **Setup Type** screen, select **Cluster Manager** (Electric Make also installs automatically with the Cluster Manager) and click **Next**.
5. On the **Choose Destination Location** screen, accept the default installation directory or browse to select an alternative directory.

**Notes:**

- Avoid selecting an alternative directory that includes spaces in the name. Spaces can create problems when configuring connections with other command-line-based components.
- If you plan to install Electric Make in a non-default location, use the same location on all agent hosts and on the Cluster Manager host.

Click **Next**.

6. On the **Base Setup** screen, choose whether you want to install Electric Runner client applications (which enable you to run Accelerator administration tools) and click **Next**.
7. On the **Cluster Manager** screen, enter Cluster Manager configuration options:
  - Accept the default ports or type in alternative port numbers if the defaults are already in use. For example, IIS and Apache also use port 80 by default.
  - Accept the default to keep old log files or select the checkbox to remove old log files.
  - Accept the default (checked checkbox) to leave web server log rotation turned on or clear the checkbox to turn off log rotation. **IMPORTANT:** Log rotation might affect Cluster Manager performance.
  - Select the type of database to use.

**Note:** If you do not use MariaDB, the database must already exist and you must be able to connect to it. The installer does *not* validate database connections.

Click **Next**.

9. On the next **Cluster Manager** screen, continue to enter Cluster Manager configuration options:
  - You can change the Cluster Manager `admin` password or accept the default password (`changeme`).
  - You do not need to migrate the existing database or back up the local database if this is your first Cluster Manager installation.
  - Fill in the user name or choose a user that the Cluster Manager service should run as or leave blank. Choose a password for the Cluster Manager service user or leave blank.

**Note:** If you plan to use a host grid, the user selected for the Cluster Manager Service User must be fully enabled to start and stop grid jobs.

Click **Next**.

10. On the `Cluster Manager Database` screen, type in the Cluster Manager database port number. For MS SQL, use port 1433.

If you did not select MariaDB as your database type, the following additional fields are available:

- **Database Host/IP Address**
- **Database User**
- **Database Password**
- **Database Name (IMPORTANT: Do *not* use a . (period) in the database name. A period in the name will prevent the Cluster Manager from starting.)**

Click **Next**.

11. When the **Start Copying Files** screen appears, click **Next**.
12. The **Installing** screen displays while the installation proceeds. When installation is finished, the **Complete** screen displays. Click **Finish**.

Installation is complete. The installation log file is in the install directory's root by default.

**Note:** If Apache fails to start properly after the Cluster Manager installs, reboot the system.

## Installing Electric Agent/EFS

Electric Agent/EFS software must be installed on each machine in the cluster. Electric File System (EFS) and the Electric Agent are installed simultaneously on each host machine during Electric Agent/EFS installation. Multiple instances of Electric Agent/EFS pairs can be set up to run in parallel on a host. For example, if you have a multiprocessor machine, you might want to set up an Electric Agent for each processor. More information on running multiple agents is available in the ElectricAccelerator online help.

If you are upgrading a previously-installed ElectricAccelerator version, follow the upgrade instructions *before* attempting to install the new version.

Your tool chain should be installed on each agent host. You can virtualize the tool chain in some cases, but this can be problematic especially when the Windows registry is involved. For performance reasons, you should install the tool chain on each agent host. Many companies use “ghosting” software for this purpose.

**IMPORTANT:** “Ghosting” with the Electric Agent already installed is not recommended.

## Installing Electric Agent/EFS in a Grid Environment

You must install the Electric Agent/EFS on each machine in the grid that ElectricAccelerator will use. The actual installation process for the Electric Agent/EFS is the same whether or not you use a grid *except* that you must answer “yes” (**y**) to any prompt that asks whether you plan to use a grid environment, such as LSF.

**Note:** After the Electric Agent/EFS is installed, it remains dormant until the grid management software schedules an agent connect script to run on that host.

**IMPORTANT:** If Symantec antivirus software is installed on your intended agent machines, disable it before installing Electric Agent/EFS to avoid serious file system conflicts. If Symantec antivirus cannot be disabled, put C:\ECloud in an exclusion list or disable the AutoProtect feature. Electric Cloud generally considers agent machines safe, because they are internal machines behind a firewall. For more information, contact Electric Cloud technical support. For contact information, see <http://electric-cloud.com/support>.

You can install the Cluster Manager and agents at the same time on the same machine.

## Installation Procedure

1. Log in as Administrator. (You must be a member of the Administrator group—Administrator privileges are not sufficient.) If you are running *rdp* on the Cluster Manager server, ensure that *rdp* is in installation mode: `change user/install`.
2. Double-click the `ElectricAccelerator-<version>-<platform>-Install` installer file. (For Windows Server 2008 or later, the administrator user must right-click the file and select **Run as administrator**.)

**Notes:**

- The installation packages might need a few minutes to extract.
- If a security alert pop-up appears, click **unblock** and continue.
- ElectricAccelerator requires the Microsoft Visual C++ 2005 SP1 Redistributable. If it is already installed, select the checkbox.

Click **Next** to continue.

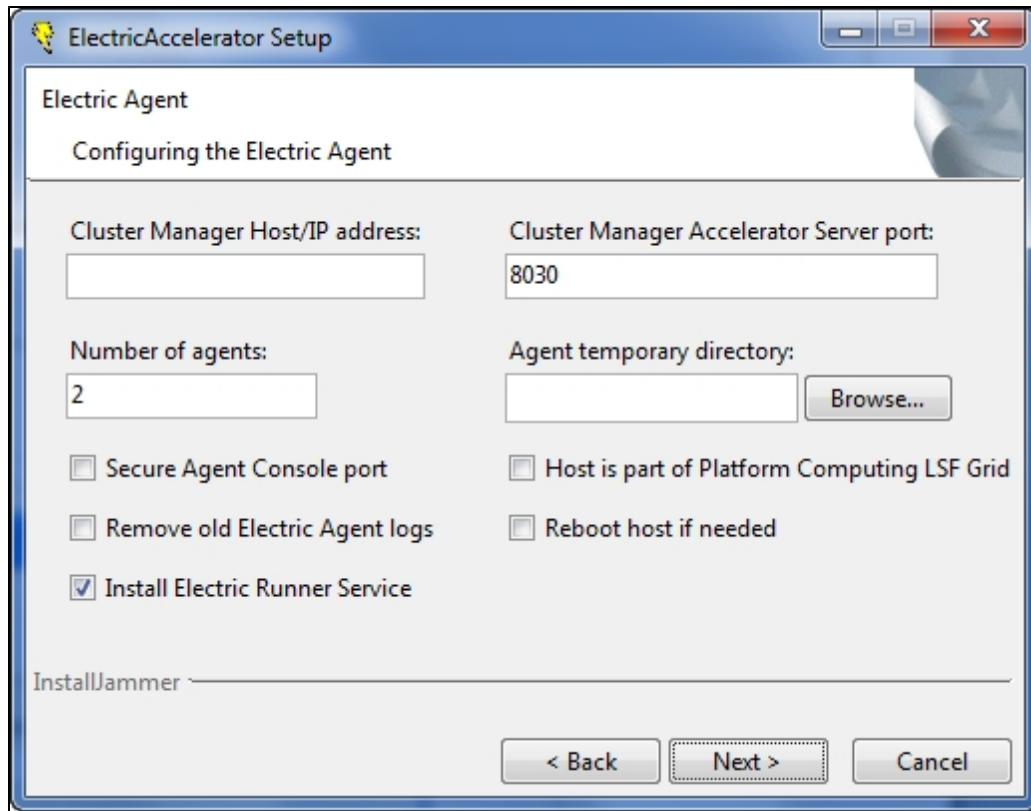
3. When the **Welcome** screen appears, click **Next** to continue to the **Setup Type** screen.
4. On the **Setup Type** screen, select **Electric Agent**, and click **Next**.
5. On the **Choose Destination Location** screen, accept the default installation directory or browse to select an alternative directory.

**Note:** Do not select an alternative directory that includes spaces in the name. Spaces can create problems when configuring connections with other command-line-based components.

Click **Next**.

6. On the **Base Setup** screen, choose whether you want to install Electric Runner (eRunner) client applications, and click **Next**.
7. On the **Electric Agent** screen, enter options for the locally installed Electric Agent/EFS.
  - Type in the Cluster Manager host name or IP address.
  - Accept the default Cluster Manager port 8030 or type in the alternative port that you supplied during the Cluster Manager server installation.
  - Enter the number of agents to run. The installer calculates the default number of agents based on the effective number of CPUs on the machine. Default=1, if one CPU is present. If more than one CPU is present, the default value is the number of effective CPUs. The maximum number of agents allowed on one 32-bit machine is 32; the maximum for one 64-bit machine is 64.
  - Accept the default agent temporary directory, or choose an alternative. On Linux or Solaris, this directory must not be a symbolic link.
  - Accept the default for the **Secure Agent Console Port** checkbox if you will not use the secure port, or select the checkbox if you want to use the secure port.
  - If this agent machine is part of the grid, select the **Host is part of Platform Computing LSF Grid** checkbox. (For this field, “LSF” refers to all grid engines.)
  - (Optional) Select the **Remove old Electric Agent logs** checkbox.
  - (Optional) Select the **Reboot host if needed** checkbox.
  - (Optional) Select the **Install Electric Runner Service** checkbox.

**Note:** eRunner is a “helper” service normally installed on all agent machines. This service listens for commands to execute on agents, facilitating administration tasks. For example, with eRunner you can upgrade all agents at the same time, remotely.



Click **Next**.

8. (Windows only) Select the user accounts you will use to run agents. Accept the default ECloud internal user or select **Existing User**. If you select **Existing User**, click **Add User** to add a user account. Then click **Next**.
9. On the **Electric Runner Server** screen, enter options for the Electric Runner server.
  - Accept the default Electric Runner Server port or type in an alternative.
  - Accept the default to leave old Electric Runner logs or select the checkbox to remove old logs.

Click **Next**.

11. When the **Start Copying Files** screen appears, click **Next**.
12. The **Installing** screen displays while the installation proceeds. When installation is finished, the **Complete** screen displays. Click **Finish**.

Installation is complete. The installation log file is in the install directory's root by default.

### **Agent Communication and Firewall Settings**

Because the ports used to communicate with agents are dynamic, you might experience issues on Windows agent hosts depending on your firewall settings.

If you experience installation issues, exclude the following programs from the block list during agent host installation:

- C:\ecinst\ecinstconf.exe
- C:\ecinst\ecclouduninst.exe
- C:\ecinst\fsize.exe
- C:\ecinst\Setup.exe
- C:\ecinst\SetupErannerTmp.exe
- C:\ERunnerTmp\i686\_win32\bin\erunnerdtmp.exe

These programs exist only during Accelerator installation. You might find it easier to disable communication restrictions with the agent host during agent installation. If you do not want to do this:

1. Create folders C:\ecinst and C:\ERunnerTmp\i686\_win32\bin.
2. Move files with those specified names into these directories.
3. Exclude these programs from the “blocked programs” list.
4. Delete the directories C:\ecinst and C:\ERunnerTmp.
5. Install agents.

## Installing Electric Make

eMake can be installed on a networked machine or on a shared file server accessible to other build machines. Wherever eMake is installed, it must have access to the Cluster Manager machine and agents on the cluster host machines. If you are upgrading a previously installed ElectricAccelerator version, follow the upgrade instructions *before* attempting to install the new version.

**Note:** An eMake-only installer is available, which lets you streamline eMake client installation.

After eMake is installed, you must configure eMake for your build environment and enable communication with the Cluster Manager. For details, see the “Setting Up ElectricAccelerator” chapter of the *ElectricAccelerator Electric Make User Guide* at [http://docs.electric-cloud.com/accelerator\\_doc/AcceleratorIndex.html](http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html).

You can install the Cluster Manager and agents at the same time on the same machine.

### Installation Procedure

1. Log in as Administrator. (You must be a member of the Administrator group—Administrator privileges are not sufficient.) If you are running *rdp* on the Cluster Manager server, ensure that *rdp* is in installation mode: `change user/install`.
2. Double-click the `ElectricAccelerator-<version>-<platform>-Install` installer file. (For Windows Server 2008 or later, the administrator user must right-click the file and select **Run as administrator**.)

#### Notes:

- The installation packages might need a few minutes to extract.
- If a security alert pop-up appears, click **unblock** and continue.
- ElectricAccelerator requires the Microsoft Visual C++ 2005 SP1 Redistributable. If it is already installed, select the checkbox.

Click **Next** to continue.



3. When the **Welcome** screen appears, click **Next**.
4. On the **Setup Type** screen, select **Electric Make**, and click **Next**.
5. On the **Choose Destination Location** screen, accept the default installation directory or browse to select an alternative directory. Ensure the Electric Make path matches the path used for the installed Electric Agent.

**Note:** Do not choose an alternative directory that includes spaces in the name. Spaces can create problems when configuring connections with other command-line-based components.

An error appears if you do not have permission to write to the alternative directory. If this occurs, you must either acquire permission or exit the installer, then log in as root, and then restart the installation.

Click **Next**.

6. On the **Base Setup** screen, choose whether you want to install Electric Runner client applications. eRunner is a “helper” daemon normally installed on all agent machines. This daemon listens for commands to execute on agents, facilitating administration tasks. For example, with eRunner you can upgrade all agents at the same time, remotely. Make your selection and click **Next**.
7. If the machine already has Electric Make installed *and* you chose to install this version of eMake in a different location, you can allow multiple eMake installations on the same machine. If you don't allow this, the previous version of eMake will be uninstalled. Choose your option and click **Next**.
8. When the **Start Copying Files** screen appears, click **Next**.
9. The **Installing** screen displays while the installation proceeds. When installation is finished, the **Complete** screen displays. Click **Finish**.

Installation is complete. The installation log file is in the install directory's root, by default.

## Performing a Silent Installation

If you are installing on a series of identical machines (such as a series of cluster hosts), you can use the “silent” installation method, which installs components automatically without user interaction.

**Note:** On Windows, if you invoke the installer from the command line, an “Unknown Publisher” security warning might appear. You can disregard this warning and proceed with installation.

## Installer Command-Line Options

Use the following command-line options when performing a silent installation. The options are the same values that a user would normally set through the installer interface. Use this format:

```
<installer filename> [options]
```

This table lists each command-line option's equivalent in the installer UI and the variable that is set in the installer properties file. You can use the resulting properties file for running silent installations.

### Notes:

- You can use the values “yes”, “y”, “1” and “no”, “n”, “0” interchangeably within installer command-line options.
- For `--cmdbtype` and `--type`, differences exist between valid command-line option arguments and valid properties file parameters. Ensure that you provide the correct input for each method.

| Command-line option                                                     | Variable set in the installer properties file | Description                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equivalent installer UI field                                           |                                               |                                                                                                                                                                                                                                                                                                                                                                  |
| Allow multiple Emake installations in separate directories              | EC_EMAKE_ALLOW_MULTIPLE_EMAKES=<br>y or n     | Allows multiple emake installations to exist on the same machine if they are installed in different directories. If you don't allow multiple eMakes, the previous version of eMake will be uninstalled.<br>This option is available only if you choose a different installation directory from the current eMake installation.                                   |
| --adminuserpassword [ARG]<br><br>Cluster Manager Administrator Password | EC_CM_ADMINUSER_PASSWORD=                     | Sets the Cluster Manager Administrator user password.                                                                                                                                                                                                                                                                                                            |
| --agentallowreboot <y or n><br><br>Reboot the host if needed            | EC_AGENT_REBOOT=y or n                        | Indicates if you want to reboot after installing Electric Agent/EFS. Default: n<br>For Windows, if you use n, the installer does not restart the Agent service; reboot the host to ensure EFS works properly. Windows might prompt before the host is rebooted.<br>For UNIX, the machine does not reboot unless required, even if you specify EC_AGENT_REBOOT=y. |
| --agentcmhost [ARG]<br><br>Cluster Manager Host/IP Address              | EC_AGENT_CMHOST=<hostname or IP address>      | Sets the Cluster Manager hostname or IP address for this host to connect to. Example: 192.205.2.19 or winlong-cm<br><b>Not required</b> if using a grid.                                                                                                                                                                                                         |
| --agentcmport [ARG]<br><br>Cluster Manager Accelerator Server Port      | EC_AGENT_CMPORT=8030 (default)                | Sets the Cluster Manager server port number for this host to connect to. Not required if using a grid.                                                                                                                                                                                                                                                           |
| --agentinstallerunnerd <y or n><br><br>Install Electric Runner Service  | EC_AGENT_INSTALL_ERUNNERD=y or n              | y installs eRunnerd on agent machines. Default: y                                                                                                                                                                                                                                                                                                                |

| Command-line option                                                                      | Variable set in the installer properties file | Description                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equivalent installer UI field                                                            |                                               |                                                                                                                                                                                                    |
| <pre>--agentislsfhost &lt;y or n&gt;</pre> <p>Host is part of LSF Computing LSF Grid</p> | EC_AGENT_IS_LSF_HOST=y or n                   | Indicates if the agent host is on the grid. For this option/parameter, the term “LSF” refers to all grid engines. Default: n                                                                       |
| <pre>--agentnumber [ARG]</pre> <p>Number of Agents</p>                                   | EC_AGENT_AGENT_NUMBER=1 to 32                 | Sets the number of agents to set up on the host. The maximum is 32 for 32-bit and 64 for 64-bit machines.                                                                                          |
| <pre>--agentpassword [ARG]</pre> <p>ECloud Internal User Shared Password</p>             | EC_AGENT_WINUSER_PASSWORD=                    | Sets the password for ECloudInternalUser (Windows only).                                                                                                                                           |
| <pre>--agentremovelogs &lt;y or n&gt;</pre> <p>Remove old Electric Agent logs</p>        | EC_AGENT_REMOVE_LOGS=y or n                   | Removes old agent log files. If not, the install appends to them. Default: n                                                                                                                       |
| <pre>--agentsecureconsole &lt;y or n&gt;</pre> <p>Secure Agent Console port</p>          | EC_AGENT_SECURE_CONSOLE_PORT= y or n          | y requires an agent-generated key to be entered before commands will run on the agent console port. Default: n                                                                                     |
| <pre>--agentskipecfs &lt;1 or 0&gt;</pre> <p>n/a</p>                                     | n/a                                           | Prevents (y) the installer from installing EFS. Default: 0 (n)                                                                                                                                     |
| <pre>--agentskiplofs &lt;1 or 0&gt;</pre> <p>n/a</p>                                     | n/a                                           | Prevents (y) the installer from installing LOFS. Default: 0 (n)                                                                                                                                    |
| <pre>--agenttempdir [ARG]</pre> <p>Agent temporary directory</p>                         | EC_AGENT_TEMPDIR=<dir>                        | <p>Sets the temporary directory for all agent files. On Linux or Solaris, this directory must not be a symbolic link.</p> <p>Windows default:<br/>C:\WINDOWS\temp<br/>Linux/UNIX default: /tmp</p> |
| <pre>--agentuserlist [ARG]</pre> <p>Existing User</p>                                    | n/a                                           | Sets a list of username/password pairs to be used as login accounts for agents (Windows only).                                                                                                     |

| Command-line option                                                                           | Variable set in the installer properties file           | Description                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equivalent installer UI field                                                                 |                                                         |                                                                                                                                                                  |
| <b>--backupdb &lt;y or n&gt;</b><br><br><b>Back up local database</b>                         | EC_CM_BACKUPDB=y or n                                   | Backs up the local database only. Remote databases are not backed up. Default: n                                                                                 |
| <b>--baseinstallerrunner &lt;y or n&gt;</b><br><br><b>Install Electric Runner client apps</b> | EC_BASE_INSTALL_ERUNNER=y or n                          | Installs eRunner client applications on Cluster Manager and Electric Make machines. Default: y                                                                   |
| <b>--cmaccelport [ARG]</b><br><br><b>Cluster Manager Accelerator Server port</b>              | EC_CM_ACCELPORT=8030 (default)                          | Sets the Cluster Manager Accelerator server port number for unencrypted traffic.                                                                                 |
| <b>--cmaccelsport [ARG]</b><br><br><b>Cluster Manager Secure Accelerator Server port</b>      | EC_CM_ACCELSPORT=8031 (default)                         | Sets the Cluster Manager Accelerator server port number for encrypted traffic.                                                                                   |
| <b>--cmdbhost [ARG]</b><br><br><b>Database Host/IP address</b>                                | EC_CM_DBHOST=localhost (default)                        | Sets the Cluster Manager database host machine.                                                                                                                  |
| <b>--cmdbname [ARG]</b><br><br><b>Database Name</b>                                           | EC_CM_DBNAME=ecloud (default)                           | Sets the name of the database to create on the database server. If you do not use the default local database, you must provide the name of an existing database. |
| <b>--cmdbpassword [ARG]</b><br><br><b>Database Password</b>                                   | EC_CM_DBPASSWORD=ecloud (default)                       | Sets the user password to use when connecting to the database server.                                                                                            |
| <b>--cmdbport [ARG]</b><br><br><b>Database Port</b>                                           | EC_CM_DBPORT=3306 (default)                             | Sets the database listening port. Use 1433 for MS SQL.                                                                                                           |
| <b>--cmdbtype &lt;mariadb, mysql, oracle, or mssql&gt;</b><br><br><b>Database Type</b>        | EC_CM_DBTYPE=MariaDB (default), MySQL, Oracle, or MSSQL | Sets the type of database to use for Cluster Manager.                                                                                                            |
| <b>--cmdbuser [ARG]</b><br><br><b>Database User</b>                                           | EC_CM_DBUSER=root (default)                             | Sets the user name to use when connecting to the database server.                                                                                                |

| Command-line option                                                     | Variable set in the installer properties file        | Description                                                                                                                                       |
|-------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Equivalent installer UI field                                           |                                                      |                                                                                                                                                   |
| <b>--cmhttpport [ARG]</b><br>Cluster Manager HTTP port                  | EC_CM_HTTPPORT=80<br>(default)                       | Sets the Cluster Manager HTTP server port.                                                                                                        |
| <b>--cmhttpsport [ARG]</b><br>Cluster Manager HTTPS port                | EC_CM_HTTPSPORT=443<br>(default)                     | Sets the Cluster Manager HTTPS server port.                                                                                                       |
| <b>--cmlogrotate &lt;y or n&gt;</b><br>Rotate Cluster Manager logs      | EC_CM_LOGROTATE=y or n                               | Rotates Apache logs.<br>Default: y                                                                                                                |
| <b>--cmmigratedb &lt;y or n&gt;</b><br>Migrate existing database        | EC_CM_MIGRATEDB=y or n                               | Migrates the database; this value is meaningful only if performing an upgrade. Default: n                                                         |
| <b>--cmremovelogs &lt;y or n&gt;</b><br>Remove old Cluster Manager logs | EC_CM_REMOVE_LOGS=y or n                             | Removes old Cluster Manager log files. If not, the install appends to them.<br>Default: n                                                         |
| <b>--cmservername [ARG]</b><br>n/a                                      | EC_CM_SERVERNAME=                                    | Sets the Apache/SSLserver name.                                                                                                                   |
| <b>--cmserviceuser</b><br>Cluster Manager Service User                  | EC_CM_SERVICEUSER=<existing LDAP user or local user> | Sets the user to run the Cluster Manager service.                                                                                                 |
| <b>--cmserviceuserpassword</b><br>Cluster Manager Service User Password | EC_CM_SERVICEUSER_PASSWORD=                          | Sets the password to use for the Cluster Manager service user. If not specified, the account that Cluster Manager runs as is used (Windows only). |
| <b>--debug</b><br>n/a                                                   | n/a                                                  | Runs the installer in debug mode.                                                                                                                 |
| <b>--debugconsole</b><br>n/a                                            | n/a                                                  | Runs the installer with the debug console open.                                                                                                   |
| <b>--erunnerdport</b><br>Electric Runner Server Port                    | EC_ERUNNERD_PORT=2411<br>(default)                   | Sets the port for eRunnerd to listen on.                                                                                                          |

| Command-line option                                                                    | Variable set in the installer properties file | Description                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equivalent installer UI field                                                          |                                               |                                                                                                                                                                                                                                                                                                                                                |
| <pre>--erunnerdremove logs &lt;y or n&gt;</pre> <p>Remove old Electric Runner logs</p> | EC_ERUNNERD_REMOVE_LOGS=y or n                | Removes old eRunnerd logs. If not, the install appends to them. Default: n                                                                                                                                                                                                                                                                     |
| <pre>--finalprefix [ARG]</pre> <p>n/a</p>                                              | n/a                                           | Sets the location where the installed directory tree will be located. Use this option when --prefix is a temporary location that is not the final destination for the product.                                                                                                                                                                 |
| <pre>--ignoreoldconf &lt;y or n&gt;</pre> <p>n/a</p>                                   | n/a                                           | Ignores the previous configuration.                                                                                                                                                                                                                                                                                                            |
| <pre>--mode &lt;console, silent, or standard&gt;</pre> <p>n/a</p>                      | n/a                                           | Sets the mode in which to run the installer. For a console login, standard mode and console mode are identical. For a GUI machine, <i>standard</i> brings up the UI. On Linux or Solaris, if you are running the X Window System, you must use <i>console</i> if you want to invoke console mode. For silent installation, use <i>silent</i> . |
| <pre>--noredist &lt;y or n&gt;</pre> <p>Do not install the redistributables</p>        | EC_BASE_NOREDIST=y or n                       | Does not install the Microsoft Visual C++ 2005 SP1 Redistributable (Windows only). Default: n                                                                                                                                                                                                                                                  |
| <pre>--pdfreader [ARG]</pre> <p>&lt;browse to location&gt;</p>                         | UnixPDFReader=<path to PDF reader>            | Sets the PDF reader to use.                                                                                                                                                                                                                                                                                                                    |
| <pre>--prefix [ARG]</pre> <p>Destination Folder</p>                                    | InstallDir=<dir>                              | Sets the installation directory. Windows default: C:\ECloud UNIX default: /opt/ecloud                                                                                                                                                                                                                                                          |
| <pre>--propertyfile [ARG]</pre> <p>n/a</p>                                             | n/a                                           | Sets the property file from which to read installer options.                                                                                                                                                                                                                                                                                   |
| <pre>--removezips &lt;1 or 0&gt;</pre> <p>n/a</p>                                      | n/a                                           | Removes (1) zip files after installation.                                                                                                                                                                                                                                                                                                      |

| Command-line option                                                                       | Variable set in the installer properties file                                                                   | Description                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equivalent installer UI field                                                             |                                                                                                                 |                                                                                                                                                                                                                   |
| <pre>--rootrun &lt;1 or 0&gt;</pre><br>n/a                                                | n/a                                                                                                             | Allows the installer to run when root privileges are not present and disables the execution of installer steps that would require root privileges. This option does not change access privileges. 1 (y) or 0 (n). |
| <pre>--rwprefix [ARG]</pre><br>n/a                                                        | n/a                                                                                                             | Specifies the location for read/write files.                                                                                                                                                                      |
| <pre>--skiprun &lt;1 or 0&gt;</pre><br>n/a                                                | n/a                                                                                                             | Prevents (1) the installer from starting the agent or Cluster Manager                                                                                                                                             |
| <pre>--temp [ARG]</pre><br>n/a                                                            | n/a                                                                                                             | Sets the temporary directory used by this program.                                                                                                                                                                |
| <pre>--test</pre><br>n/a                                                                  | n/a                                                                                                             | Runs the installer without installing any files.                                                                                                                                                                  |
| <pre>--type &lt;agent, emake, cm, or full&gt;</pre><br><i>&lt;select install type&gt;</i> | InstallType=Electric Agent + eMake, eMake, Cluster Manager + eMake, or Electric Agent + eMake + Cluster Manager | Type of installation to perform.                                                                                                                                                                                  |
| <pre>--version</pre><br>n/a                                                               | n/a                                                                                                             | Displays installer version information.                                                                                                                                                                           |

## Creating an Installer Properties File

An installer properties file is a text file that defines installation parameters. These parameters are the same values that a user would normally set through the installer interface or command line.

To create an installer properties file:

1. Run an installation with your desired settings.

This creates a properties file (`install.props`) in the top-level install directory.

2. Use the resulting properties file for subsequent silent installations of the same component type.

Components are installed individually so you must create an installer properties file for each ElectricAccelerator component you intend to install.

The table beginning on [page 3-22](#) details the parameters within installer properties files.

## Automating a Linux or Solaris Silent Installation

1. Make sure you already have a properties file (`install.props`) that was created by a successful installation.
2. Log in to the remote machine as root.
3. Invoke the installer:

```
./<installer filename> --mode silent --propertyfile <properties file>
```

## Automating a Windows Silent Installation

1. Make sure you already have a properties file (`install.props`) created by a successful installation.
2. Log in to the remote machine as Administrator.
3. Invoke the installer in a DOS shell:

```
<installer filename> /mode silent /propertyfile <full path\properties file>
```

If you are performing a silent upgrade on an agent host by running the installation on the host itself, you might be prompted before the machine is rebooted. This prompt occurs if others are logged in to the machine when you run the agent upgrade.

## Additional Installation Options

- Electric Runner Client - The Electric Runner Client component installs platform-independent tools (`clusterexec`, `clusterupload`, and `clusterdownload`) that allow you to perform operations across all hosts simultaneously. The tools allow you to:
  - Start and stop agents
  - Reboot hosts
  - Run commands on hosts
  - Upload files
  - Download files
- Electric Runner Server - The Electric Runner Server component installs the server side (`erunnerd`) on agents to allow them to serve requests from tools. If you decided not to install eRunner during Cluster Manager installation, you do not have access to these tools.
- Custom - A custom installation allows you to install multiple components at once.

## Installing JDBC Drivers for MySQL or Oracle Databases

Electric Cloud does not distribute 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.

### Installing the JDBC Driver for MySQL Databases

To install the JDBC driver for MySQL databases, complete the following steps.

1. Download the latest version of Connector/J for your platform from <https://dev.mysql.com/downloads/connector/j/> and install it.
2. Locate the `mysql-connector-java-<version>-bin.jar` file among the files that were installed.

For example, on Windows: `C:\Program Files (x86)\MySQL\MySQL Connector J\mysql-connector-java-5.1.30-bin.jar`.



3. Rename the file to `mysql-connector.jar`.
4. Copy the file to `<ECloud install>/<arch>/lib/`.
  - On Linux, the default location is `/opt/eccloud/i686_Linux/lib/`.
  - On Windows, the default location is `C:\ECloud\i686_win32\lib\`.
5. Restart the Cluster Manager service.

For more information, see [Stopping, Starting, or Restarting the Cluster Manager Service](#).

## Installing the JDBC Driver for Oracle Databases

To install the JDBC driver for Oracle databases, complete the following steps.

1. Download the appropriate `ojdbc6.jar` JDBC driver file for your database version from <http://www.oracle.com/technetwork/database/enterprise-edition/jdbc-112010-090769.html>.
2. Copy the `ojdbc6.jar` file to `<ECloud install>/<arch>/lib/`.
  - On Linux, the default location is `/opt/eccloud/i686_Linux/lib/`.
  - On Windows, the default location is `C:\ECloud\i686_win32\lib\`.
3. Restart the Cluster Manager service.

For more information, see [Stopping, Starting, or Restarting the Cluster Manager Service](#).

## Migrating an eMake-Only Installation to a Different Machine

On all platforms, you can relocate the complete eMake install directory (anything under the *install dir*, starting with the *arch* directory). A simple file copy is sufficient.

On Windows systems, you must ensure that the Visual Studio 2005 runtime libraries are installed. You can install the libraries by running `.../i686_win32/bin/install_redist32.bat` and/or `install_redist64.bat` on the new machine.

You can also choose to add the new location of the bin directory to the PATH.

## Installing the Backward-Compatibility Package on Agent Machines

Electric Cloud recommends that all components (Cluster Manager, Electric Agent/EFS, and Electric Make) on all machines in the cluster are upgraded to the latest version. However, you can still use eMake 8.0 with Agents on Electric Agent/EFS machines running versions as old as 7.2, as long as a specific version of backward compatibility package (BCP) is installed on those Electric Agent/EFS machines that corresponds to each version of eMake host that those agents must service.

Electric Cloud provides archives of eMake versions on the Electric Cloud FTP site.

There might be different reasons why you want to install the backward-compatibility package:

- You have new agents in the cluster that have only the most recent version of ElectricAccelerator, and you have old agents that were upgraded to the most recent version. To allow old eMakes to use the new agent machines, you must install the backward-compatibility package on the new agents.
- You encountered incompatibility error messages, indicating the eMake and agent software versions are not compatible:

```
ERROR EC1050: 049300C4:
```

```
The protocol version of Electric Make (45) is incompatible with the software installed on the Electric Cloud cluster 192.168.6.8 (55).
```

```
You need to upgrade your copy of Electric Make; aborting build
```

ERROR EC1050: 049300C4:

The protocol version of this application (45) is incompatible with the software installed on the Electric Accelerator cluster 192.168.6.8 (55).

You need to upgrade your client application; aborting build

## Installing on a Single Agent Machine

1. Open a terminal window.
2. Change to the Electric Cloud installation directory (for example `c:/ECloud` or `/opt/eccloud`).
3. Download the appropriate set of archive files (for example, `i686_win32_bcp.zip` [all previous eMake versions] or `i686_win32_7.0.0_bcp.zip` [a single eMake version]) from the Electric Cloud FTP site: `accelerator/emake_archive/<platform>`.
4. Unpack the archive in the current directory (`<installDir>`). For Windows, make sure the extraction destination is `<installDir>` without any sub-directories, such as `c:/ECloud`.
5. Repeat the process for each new agent machine.

## Installing on Multiple Agent Machines

1. Open a terminal window.
2. Change to a temporary directory (such as `/var/tmp`, or `c:/Windows/Temp`).
3. Download the appropriate set of archive files (for example, `i686_win32_bcp.zip` [all previous eMake versions] or `i686_win32_7.0.0_bcp.zip` [a single eMake version]) from the Electric Cloud FTP site: `accelerator/emake_archive/<platform>`.
4. Unpack the archive in the current directory. For Windows, make sure the extraction destination is the temporary directory (or the directory from step 2) without any sub-directories, such as `c:/Windows/Temp`.
5. Run (as an example): `clusterupload --cm=<cmname> i686_win32 c:/ECloud`.

## Protocol Changes

Occasionally, Accelerator might contain protocol changes that make it necessary to update the eMake version on the build machines. An eMake-only installer is available for this type of update.

## Chapter 4: Configuring ElectricAccelerator

Configuring Accelerator properly is important to using the software successfully. The following configuration information will help get you started.

- [Configuring ElectricAccelerator on Linux or Solaris](#)
- [Configuring ElectricAccelerator on Windows](#)
- [Using the accelerator.properties File](#)
- [Configuring Agent Log Rotation](#)
- [Changing the Disk Cache Directory and Agent Temporary Storage Location](#)
- [Default Directories](#)
- [Logging In and Enabling Licensing](#)
- [Enabling Resource Management](#)
- [Stopping, Starting, or Restarting the Cluster Manager Service](#)
- [Installing an Apache Server Certificate](#)
- [Configuring LSF](#)
- [Enabling Grid Host Manager](#)
- [Documentation Roadmap](#)

## Configuring ElectricAccelerator on Linux or Solaris

### RHEL 6 and Accelerator Services Started from a Shell

On RHEL 6, if Accelerator services are started from a shell (as opposed to at boot time), you might encounter errors such as

```
java.lang.OutOfMemoryError: unable to create new native thread
```

This type of error occurs because RHEL 6 greatly decreased the default maximum number of threads per user.

As a workaround, comment out the `nproc` line in the `/etc/security/limits.d/90-nproc.conf` file.

### Solaris 10 Configuration and Debugging

To get the maximum useful information from any core dumps that might occur under Solaris 10 systems (SPARC and x86), run `coreadm -G all -I all` (as superuser) at any time. This reconfigures the machine (persistently, in `/etc/coreadm.conf`) to include the maximum information in core dumps.

## Configuring ElectricAccelerator on Windows

### Electric Agent/EFS Machines

Disable the Windows Error Reporting service (if applicable to your Windows version). This prevents popup windows from appearing after applications crash, which could cause builds to time out while the service is waiting for user input.

### Windows 8 and Windows Server 2012 eMake and Electric Agent/EFS Machines

On Windows 8 and Windows Server 2012 eMake and Agent machines, you must disable Admin Approval Mode. Follow these steps:

1. Type `secpol.msc` in the Start menu and then press Enter.
2. Double-click **Local Policies**, then double-click **Security Options**.
3. Scroll to the bottom of the entry. Locate and double-click

#### **User Account Control: Run all administrators in Admin Approval Mode**

4. Set it to disabled and click **OK**.
5. Reboot the machine.

**Note:** This configuration is required because of a change in the Windows 8 and Windows Server 2012 Admin Approval Mode defaults. Leaving Admin Approval Mode enabled might result in performance degradation.

### Firewall Settings

Because the ports used to communicate with agents are dynamic, issues might exist on Windows agent hosts depending on your firewall settings.

If you must lock down communication with an agent host, exclude the following programs from the firewall block list:

- `C:\Ecloud\i686_win32\bin\ecagent.exe`
- `C:\Ecloud\i686_win32\bin\erunnerd.exe`

## Agent-Side Applications

Applications that are running on agents must be properly initialized for the users that run the agent processes. By default, the users `ECloudInternalUser1`, `ECloudInternalUser2`, and so on, own the processes run by agents. Agents can be run as any user, but each agent must have a unique user, which is a requirement for agents to function properly. (Contact Electric Cloud Technical Support for additional information. For contact information, see <http://electric-cloud.com/support>.)

**Note:** The users `ECloudInternalUser1`, `ECloudInternalUser2`, and so on (or the users you choose to run agent processes), must be local administrators on the agent machines.

This requirement requires additional setup steps for agent machines, because some applications require per-user setup (WinZip, Visual Studio 2005 and 2008, Microsoft Office, and so on). Setup is particularly important for applications that display a dialog if they are not properly initialized, because this might cause stalled jobs (the application remains in interactive mode until the agent times it out for lack of activity) during the use of `eMake`.

To initialize applications, do one of the following:

- Use the `psexec` tool from Microsoft (<http://technet.microsoft.com/en-us/sysinternals/bb897553.aspx>) to run the application as different users. You need the password for the account (for `ECloudInternalUser1`, and so on, contact Electric Cloud Technical Support for the user password).
- Log in as each of the configured agent users, and run the relevant application to initialize it.
- Identify which files and registry keys must be set for a user by using Microsoft's `procmon` tool (<http://technet.microsoft.com/en-us/sysinternals/bb896645.aspx>), creating a `.reg` file, and copying the user files to create those entities for all users.

## Visual Studio

You should consider the following information when using Accelerator to build Microsoft Visual Studio projects.

### Running `vspcheck.exe`

Use the `vspcheck.exe` utility (in `C:\ECloud\i686_win32\bin`) to check agent installations that will be used for Visual Studio-based builds. This utility is included with `eMake`.

1. Invoke the utility on an agent installation and redirect the output to a text file.

For example:

```
vspcheck > vspcheck.agent1
```

2. Repeat step 1 on another agent installation in the cluster that you want to compare.

For example:

```
vspcheck > vspcheck.agent2
```

3. Use a text "diff" tool to compare the files.

For example:

```
diff vspcheck.agent1 vspcheck.agent2
```

The files should be identical except their host names (as noted in [Ensuring a Consistent Build Environment](#)).

## Before building the Visual Studio project

If you do not virtualize your Visual Studio toolchain (as Electric Cloud recommends), then before using Accelerator to build your project, you must install those applications on each agent host and then log in on each agent host and run `devenv` as the user that owns the respective agent processes. (These processes are usually named `ECloudInternalUser1`, `ECloudInternalUser2`, and so on.)

You can use the `psexec` tool to avoid logging in and out multiple times. Using this tool is more efficient, because applications such as Visual Studio or Excel store user settings in the registry and create files in the My Documents folder. Also, you must ensure that you can build your solutions or projects with the Visual Studio setup on each host.

If you install Visual Studio *after* installing Accelerator, you must register the Visual Studio add-in by running `install_ecaddin<N>.bat`, where `<N>` is 70, 71, 80, 90, 100, or 110, depending on your Visual Studio version.

If you are using Visual Studio 2005 or new, you should reduce the number of parallel builds that Visual Studio performs:

1. In Visual Studio, select **Tools > Options**.
2. In the **Options** dialog, open **Projects and Solutions > Build and Run**.
3. Set the maximum number of parallel project builds to 1.

The *ElectricAccelerator Visual Studio Integration Guide* contains more information about virtualizing the Visual Studio toolchain and about using Accelerator with Visual Studio.

## Initializing Visual Studio

Use the `psexec` method to initialize Visual Studio as follows:

```
psexec -u ECloudInternalUser1 "C:\Program Files\Microsoft Visual Studio <visual_studio_version>\Common7\IDE\devenv.exe"
```

As an alternative, disable profiles for Visual Studio by running this Microsoft Registry Editor (`regedit.exe`) script:

```
REGEDIT4
[HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\VisualStudio\<visual_studio_version>\Profile]
"AppidSupportsProfiles"="0"
```

## Microsoft Office

You must run Microsoft Office by using `psexec` (or logging in directly), because there is no registry setting to initialize Microsoft Office easily.

Ensure that the Visual Basic setting for Security is set to Medium or Lower (assuming the build tries to run VB scripts). Find this under **Tools > Options > Security > Macro Security**.

## Cygwin

Electric Cloud strongly recommends that the installation location be the same on all agents. The install location must also be the same on all eMake machines. The mount mode must be the same for all machines.

## Windows Notes

### Accelerator might unset the JAVA\_HOME environment variable

Installing Accelerator might unset the environment variable `JAVA_HOME`. Reset `JAVA_HOME` manually.

## Windows kernel non-paged pool memory might become depleted

Under high-volume network traffic, the non-paged pool memory in the Windows kernel can become depleted. This issue in the Windows kernel can be triggered by applications such as MySQL and Java server applications. Over time, this causes a system crash.

The workaround is to use the 64-bit version of Windows. Although this does not completely resolve the issue, it increases the available memory to make crashes less likely and less frequent.

## FileInfo and Superfetch services might affect EFS driver performance

The FileInfo and Superfetch services run on Windows 7 (Microsoft officially turned them off in Windows Server 2008 R2).

Because the FileInfo (used by Superfetch) filter driver issues a couple of calls for each file operation in the EFS driver, it can slow down the EFS driver.

Accelerator turns off the two services by default. You can leave them running by removing the following two lines from the runagent file (located in `<ECloud install>\<arch>\bin`):

```
catch {service stop sysmain}
catch {service stop fileinfo}
```

and rebooting the machine. Because the runagent file is overwritten when you upgrade or reinstall Huddle, you must remove these lines again and perform another reboot after an upgrade or reinstallation.

## Real-time antivirus scans on agent machines

Real-time scans can slow down builds and can cause unexpected failures because of issues with the antivirus software's DLL injection. Generally, scans do not find anything relevant, because all results are also checked on the eMake machine.

## Terminating stale processes

Certain processes might continue to run on Windows agent machines. You can terminate all “stale” processes by adding the following line to the runagent.local file (located in `<ECloud install>\<arch>\bin`):

```
[efs connect] set terminateStaleProcess 1
```

If the runagent.local file does not yet exist, then create it. This file uses Tcl script syntax.

## Support for managed code and .NET

Building managed code or .NET code has no known limitations. There are, however, areas to keep in mind:

- Agents must have the same version of .NET installed.
- Agents must be on the same service pack level and have the same operating system and tool hotfixes installed.
- The language bar must be enabled on all agent machines or disabled on all agent machines.
- Including the Global Assembly Cache in the eMake root is *not* recommended. Contact Electric Cloud technical support for more details. For contact information, see <http://electric-cloud.com/support>.

## Registry Information

To allow parallel building of Windows code, Accelerator virtualizes the registry and the file system. The following sections discuss important registry information.

### Registry Use under Windows

There are two relevant areas of registry usage during a build. By default, Accelerator virtualizes HKEY\_CLASSES\_ROOT (except HKEY\_CLASSES\_ROOT\Installer and HKEY\_CLASSES\_ROOT\Licenses).

## HKEY\_CLASSES\_ROOT

This key contains file name extensions and the COM class registration (<http://msdn.microsoft.com/en-us/library/ms724475.aspx>). Configuration data is stored under the program IDs, CLSID, Interface, TypeLib, Appld, and so on.

For entities created during the build, this information must be virtualized to all involved agents.

The following information is registered for a type library:

[http://msdn2.microsoft.com/en-us/library/ms221610\(VS.85\).aspx](http://msdn2.microsoft.com/en-us/library/ms221610(VS.85).aspx)

```
\TypeLib\{libUUID}
\TypeLib\{libUUID}\major.minor = human_readable_string
\TypeLib\{libUUID}\major.minor\HELPDIR = [helpfile_path]
\TypeLib\{libUUID}\major.minor\Flags = typelib_flags
\TypeLib\{libUUID}\major.minor\lcid\platform = localized_typelib_filename
```

Other entities that are registered by UUID are registered in different places:

[http://msdn2.microsoft.com/en-us/library/ms221150\(VS.85\).aspx](http://msdn2.microsoft.com/en-us/library/ms221150(VS.85).aspx)

A ProgID("ApplicationName") maps to and from a CLSID(GUID). The CLSID maps to the actual ActiveX component ("APP.EXE"). The type library is available from the CLSID:

```
\CLSID\TypeLib = {UUID of type library}
\CLSID\{UUID} = human_readable_string
\CLSID\{UUID}\ProgID = AppName.ObjectName.VersionNumber
\CLSID\{UUID}\VersionIndependentProgID = AppName.ObjectName
\CLSID\{UUID}\LocalServer[32] = filepath[/Automation]
\CLSID\{UUID}\InProcServer[32] = filepath[/Automation]
```

[http://msdn2.microsoft.com/en-us/library/ms221645\(VS.85\).aspx](http://msdn2.microsoft.com/en-us/library/ms221645(VS.85).aspx)

Applications that add interfaces must register the interfaces, so that OLE can find the appropriate remoting code for interprocess communication. By default, Automation registers dispinterfaces that appear in the .odl file. It also registers remote Automation-compatible interfaces that are not registered elsewhere in the system registry under the label ProxyStubClsid32 (or ProxyStubClsid on 16-bit systems).

The syntax of the information registered for an interface is as follows:

```
\Interface\{UUID} = InterfaceName
\Interface\{UUID}\Typelib = LIBID
\Interface\{UUID}\ProxyStubClsid[32] = CLSID
```

## All Other Keys

Other keys are probably not relevant to the build. HKEY\_LOCAL\_MACHINE, HKEY\_CURRENT\_USER, HKEY\_USERS, and HKEY\_CURRENT\_USER are machine specific. If other areas must be virtualized, you should add them to the `emake-reg-root` option.

## Registry Underlay

When a process in the build requests information from the registry, EFS first checks if the requested key is present in its cache. If the key is not present, EFS relays the request to the agent, which then sends the request to eMake. After receiving the response from eMake, the agent loads the key into the EFS cache, subject to the following conditions:

- If the key is not in the local registry on the agent host, the value from the eMake response is used unconditionally.



- If the key is in the local registry, the value from the local registry has precedence over the initial value from eMake, but not any value set by prior commands in the build. That is, if the key changes during the course of the build, the new value is used instead of any value from the local registry.

The order of precedence is (lowest to highest):

- Value from eMake host registry before the build starts
- Value from the agent host registry, if any
- Value set by an earlier job in the build

The additional checking of precedence lets Accelerator operate with tools that store host-specific licensing information in the registry. If the agent simply used the value from eMake unconditionally in all cases, such tools would fail to operate correctly.

Electric Cloud ***strongly recommends against*** running builds locally on agent host machines. Running builds locally on agent host machines might add relevant keys to the local machine, which take precedence over the eMake machine's keys. If a key that should come from the eMake machine (such as the typelib information for a lib generated during the build) is already present on the agent because of a local build, the wrong information is used, which might break a build.

If an agent machine has locally-created keys, remove the typelibs that are created during the build from the registry. Any typelib with an invalid path name associated with it is a likely candidate for an "underlayed" lookup.

Ideally, typelibs created by a build are known. At this point, you should check for their existence on the cluster. If an error occurs that indicates the direction of this problem (for example, a library/typelib cannot be found), investigate the failing agent's registry.

## ExcludeProcessList registry entry

You can add a multistring registry value to the agent host inside HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\ElectricFS to exclude processes from interfering with EFS and causing a crash. The ExcludeProcessList entry can list processes from McAfee AntiVirus (for example, Mcshield.exe and mfevtps.exe) or other antivirus software.

**Note:** Make these registry changes only if the system crashed previously.

## Using the accelerator.properties File

The `accelerator.properties` file allows you to modify parameters that affect a range of Accelerator behaviors. The file resides on the Cluster Manager in the following default location:

- Linux: `/opt/eccloud/i686_Linux/conf`
- Windows: `C:\ECloud\i686_win32\conf`
- Solaris SPARC: `/opt/eccloud/sun4u_SunOS/conf`
- Solaris x86: `/opt/eccloud/i686_SunOS.5.10/conf`

The following topics discuss parameters configurable through the `accelerator.properties` file.

- [Changing Log Locations](#)
- [Disabling Agents by Default](#)
- [User Authentication](#)
- [Setting Up Email Notification](#)

- [Adding Custom Protocol Mismatch Error Text](#)
- [Using the Database Connection Monitor](#)

After you modify the `accelerator.properties` file, you must apply the changes by restarting the Cluster Manager service. For more information, see [Stopping, Starting, or Restarting the Cluster Manager Service](#).

## Changing Log Locations

Modify the following parameters to change the location of build logs and accelerator logs:

- `ACCELERATOR_BUILD_LOGS_PATH=build_logs`
- `ACCELERATOR_LOG=logs/accelerator.log`

## Disabling Agents by Default

Agents are enabled by default. If you wish to disable them by default:

1. Change the `ACCELERATOR_AGENTS_STARTUP_ENABLED` property to `false`. This change affects agents installed after this point; existing agents on the Agents tab are not affected.
2. If you want the property to change the behavior of existing agents, you must restart the Cluster Manager service.

For more information, see [Stopping, Starting, or Restarting the Cluster Manager Service](#).

## User Authentication

Accelerator uses account information from multiple sources. In most cases, the primary account information source is an external LDAP or Active Directory repository: both user and group information is retrieved from the repository. *Local* users and groups can be defined within Accelerator.

### Getting Started

1. Go to the following directory on the Cluster Manager server:  
`<ECloud install>/<arch>/conf`
2. Make a copy of the `ldap_template.xml` file if you intend to use LDAP, or the `ad_template.xml` file if you prefer to use Active Directory. Save the copy in the `conf` directory as any name you choose or use the name: `securityContext.xml`.
3. Still working in `conf`, open the `accelerator.properties` file.
  - Locate the following commented-out text string:  
`#ACCELERATOR_SECURITY_CONTEXT_FILES=conf/securityContext.xml`
  - If you did not name your template copy `securityContext.xml`, replace `securityContext.xml` with the file name you chose.
  - Uncomment the `#ACCELERATOR_SECURITY_...` text string by removing the lead “#” sign.
  - Comment out `ACCELERATOR_SECURITY_CONTEXT_FILES=` (which immediately follows the line you uncommented)
4. Use the LDAP information and examples in the following sections to fill in your own copy of the LDAP template.
5. Restart the Cluster Manager service.  
For more information, see [Stopping, Starting, or Restarting the Cluster Manager Service](#).
6. After the Cluster Manager is running, log in to the Cluster Manager UI as “admin”.

7. Go to Administration > Permissions.
8. Click **Enable User** or **Enable Group**.
9. Search for the desired user or group (or search for "\*" to see all). If you set it up correctly, the requested LDAP users are visible.
10. Select the appropriate users or groups to enable using the corresponding checkbox(es).
11. Ensure that the desired permissions are set for the users or groups. (The online help system contains additional information about permissions.)

**Note:** If you experience permissions issues while reading the `ldap_template.xml` or `ad_template.xml` copy, verify that the account that runs the Cluster Manager also has read permission for that file. To diagnose problems that cause Cluster Manager startup issues, including LDAP/Active Directory configuration problems, check

```
<ECloud install>/<arch>/logs/accelerator.log.
```

## Configuring LDAP

A number of options must be customized for any LDAP configuration. The following sample configuration is from the `ldap_template.xml` file. After the sample, see a list of properties with a description.

### Sample LDAP Configuration

```
<bean id="ldapDirectoryProvider"
 class="com.electriccloud.security.ldap.LdapDirectoryProviderImpl">
 <property name="providerName" value="LDAP"/>
 <property name="url" value="ldap://myldaphost/dc=company,dc=com"/>
 <property name="userBase" value="ou=People"/>
 <property name="userSearchFilter" value="uid={0}"/>
 <property name="userSearchSubtree" value="false"/>
 <property name="userNameAttribute" value="uid"/>
 <property name="fullUserNameAttribute" value="gecos"/>
 <property name="emailAttribute" value="mail"/>
 <!--<property name="managerDn" value="uid=admin,ou=People,dc=company,dc=com"/> -->
 <!--<property name="managerPassword" value="password"/> -->
 <!--<property name="groupBase" value="ou=Group"/> -->
 <!--<property name="groupMemberFilter" value="(member={0})"/> -->
 <!--<property name="groupMemberAttributes" value="member"/> -->
 <!--<property name="groupSearchFilter" value="(objectClass=groupOfNames)"/> -->
 <!--<property name="groupNameAttribute" value="cn"/> -->
 <!--<property name="verifyCerts" value="true"/> -->
</bean>
```

The following properties configure LDAP mapping:

Property	Description
<code>emailAttribute</code>	(optional) The attribute in a user record that contains the user's email address. If the attribute is not specified, the account name and domain name are concatenated to form an email address.
<code>fullUserNameAttribute</code>	(optional) The attribute in a user record that contains the user's full name (first and last name) for display in the UI. If this attribute is not specified or the resulting value is empty, the user's account name is used instead.

Property	Description
managerDn	(optional) The DN of a user who has read-only access to LDAP user and group directories. If this property is not specified, the server attempts to connect as an unauthenticated user. Not all servers allow anonymous read-only access. <b>Note:</b> This user does not need to be an admin user with modify privileges.
managerPassword	(optional) If the managerDn property is set, this password is used to authenticate the manager user.
providerName	This human readable name is displayed in the user interface to identify users and groups that come from this provider.
userBase	This string is prepended to the <code>basedn</code> to construct the directory DN that contains user records.
userNameAttribute	The attribute in a user record that contains the user's account name.
userSearchFilter	This LDAP query is performed in the context of the user directory to search for a user by account name. The string "{0}" is replaced with the user's login ID. Typically, the query compares a user record attribute with the substituted user login ID.
userSearchSubtree	This property, if true, searches the entire subtree as identified by context. If false, (the default) then only the level identified by the context is searched.
url	The LDAP server URL is in the form <code>protocol://host:port/basedn</code> . Protocol is either <code>ldap</code> or <code>ldaps</code> (for secure LDAP). The port is implied by the protocol, but can be overridden if it is not at the default location (389 for <code>ldap</code> , 636 for <code>ldaps</code> ). The <code>basedn</code> is the path to the top level directory that contains users and groups at this site. This is typically the domain name where each part is listed with a <code>dc=</code> and separated by commas. <b>Note:</b> Spaces in the <code>basedn</code> must be URL encoded (%20).
verifyCerts	(optional) This property enables certificate verification for LDAPS connections if true.

In addition to user information, the LDAP server can be queried for **group information**. This query is optional because the local group mechanism can refer to LDAP users as well as local users. However, the following elements can be used to tell the server how to map groups in LDAP:

Property	Description
groupBase	(optional) This string is prepended to the <code>basedn</code> to construct the directory DN that contains group records.
groupMemberAttributes	(optional) A comma separated attribute names list that identifies a group member. Most LDAP configurations only specify a single value, but if there is a mixture of POSIX and LDAP style groups in the directory, multiple attributes might be required.

Property	Description
<code>groupMemberFilter</code>	(optional) This LDAP query is performed in the groups directory context to identify groups that contain a specific user as a member. There are two common forms of group record in LDAP directories: POSIX style groups where members are identified by account name, and <code>groupOfNames</code> or <code>uniqueGroupOfNames</code> records where members are identified by the full user DN. Both forms are supported, so the query is passed two parameters: "{0}" is replaced with the full user record DN, and "{1}" is replaced with the user's account name.
<code>groupNameAttribute</code>	(optional) The group record attribute that contains the name of the group.
<code>groupSearchFilter</code>	(optional) This LDAP query is performed in the context of the groups directory to enumerate group records.

### Determining LDAP Mapping

A typical POSIX user record in LDAP looks similar to the example below. To set up a mapping for this record, it is necessary to identify various record components.

First, identify the path in the directory that contains user records. In this example, the build user has a distinguished name (dn) of `uid=build,ou=People,dc=mycompany,dc=com`. This name uniquely identifies the build user account and this path splits into three parts:

- base dn: `dc=mycompany,dc=com`
- user base: `ou=People`
- user element: `uid=build`

The `baseDn` is the parent of the directory that contains users. This value is combined with the protocol and server to form the URL. In this case, the URL ends up as `ldaps://dir/dc=mycompany,dc=com`. The `userBase` is the portion of the path that identifies the directory containing all user account records. This value is used directly as the `userBase` configuration element. The remaining portion identifies the user without the `People` directory: `uid=build`. The user name is replaced in this value with the string "{0}" to form the `userSearchFilter: uid={0}`. This query allows the server to search for a user's account name by looking for a record with a matching `uid` attribute. The final mapping step is to identify user record attributes that hold the account name, full user name, and (optionally) the user's email address. In this example, the account name is `uid` (identified earlier), the full user name attribute is `gecos`, and there is no email attribute.

At this point, the server is able to authenticate a user, look up a user by name, and determine the user's full name. For many installations this is sufficient.

### Sample LDAP User Record

```
build, People, electric-cloud.com
dn: uid=jdoe, ou=People, dc=mycompany,dc=com
loginShell: /bin/bash
uidNumber: 508
gidNumber: 508
objectClass: account
objectClass: posixAccount
objectClass: top
objectClass: shadowAccount
uid: jdoe
gecos: John Doe
```

```
cn: John
homeDirectory: /net/filer/homes/build
```

Also, you can configure the server to look for **LDAP groups** that refer to user accounts. A typical group record is shown below. Like a user account, an LDAP group has a distinguished name with a baseDn, a group base, and a group element. In this case, the base dn is still `dc=mycompany,dc=com`. The `groupBase` configuration element is `ou=Group`, and the group name is `cn=build_users`.

The server must identify records in the directory that correspond to groups—it does this by applying the `groupMemberFilter` to the records in the `groupBase` directory. In this case, group records are members of the `posixAccount` object class, so the filter can be set to `objectClass=posixGroup`. To display a group by its name, the server must know which attribute represents the group name. In this case, set the `groupNameAttribute` to `cn`.

Finally, the server needs a filter to determine which accounts belong to the group and the attribute name that represents a single group member. Group membership can be identified in one of two ways. Either the members are listed by account name, or by their LDAP distinguished name. In this case, POSIX group membership is determined by account name, so set the `groupMemberAttributes` property to `memberUid`, and set the `groupMemberFilter` to `memberUid={1}`.

### Sample LDAP Group Record

```
build_users, Group, mycompany.com
dn: cn=build_users,ou=Group,dc=mycompany,dc=com
objectClass: posixGroup
objectClass: top
gidNumber: 100
memberUid: jdoe
memberUid: mary
cn: build_users
```

### Sample Active Directory Configuration

The following XML element defines parameters needed to connect to an Active Directory server and the query to use for looking up user information.

```
<bean id="adDirectoryProvider"
 class="com.electriccloud.security.ldap.ActiveDirectory Provider">
 <property name="providerName" value="ActiveDirectory"/>
 <property name="url" value="ldap://server/dc=company,dc=com"/>
 <property name="managerDn" value="cn=myuser,cn=Users,dc=company,dc=com"/>
 <property name="managerPassword" value="mypw"/>
 <property name="userBase" value="cn=Users"/>
 <property name="userSearchFilter" value="(sAMAccountName={0})"/>
 <property name="userSearchSubtree" value="false"/>
 <property name="userNameAttribute" value="sAMAccountName"/>
 <property name="fullUserNameAttribute" value="name"/>
 <property name="emailAttribute" value="userPrincipalName"/>
 <!-- <property name="groupBase" value=""/> -->
 <!-- <property name="groupMemberFilter" value="member={0}"/> -->
 <!-- <property name="groupMemberAttributes" value="member"/> -->
 <!-- <property name="groupSearchFilter" value="(objectClass=group)"/> -->
 <!-- <property name="groupNameAttribute" value="cn"/> -->
 <property name="pageSize" value="500"/>
</bean>
```

## Setting Up Email Notification

To configure the Cluster Manager to send email notifications through SMTP, define your SMTP connection properties. SMTP connection properties are contained in `accelerator.properties`. The following properties must be defined:

Property	Description
ACCELERATOR_MAIL_HOST	The name of the SMTP mail server.
ACCELERATOR_MAIL_PORT	The mail server port. Typically, this is '25' for SMTP or '465' for Secure SMTP.
ACCELERATOR_MAIL_PROTOCOL	The mail server protocol. This can be 'smtp' for SMTP or 'smtps' for Secure SMTP.

If your mail server requires an authenticated user to send mail, you must also set the following properties:

Property	Description
ACCELERATOR_MAIL_USERNAME	The user name required for authentication.
ACCELERATOR_MAIL_PASSWORD	The password to use for authentication.

For example:

```
ACCELERATOR_MAIL_HOST=smtp.electric-cloud.com
ACCELERATOR_MAIL_PORT=25
ACCELERATOR_MAIL_PROTOCOL=smtp
ACCELERATOR_MAIL_USERNAME=cm
ACCELERATOR_MAIL_PASSWORD=mypass
```

This example sets up the Cluster Manager to send mail as the 'cm' user through the `smtp.electric-cloud.com` server listening for SMTP connections on port 25.

After making changes to the mail configuration, you must restart the Cluster Manager service. For more information, see [Stopping, Starting, or Restarting the Cluster Manager Service](#).

### Configuring the Mail Policy

On the Administration > Server Settings page, you can configure various aspects of the global email notification policy. Cluster Manager sends mail notifications when messages are added to the message log. The following settings control how and when mail is sent:

Setting	Description
Email Interval	The number of minutes between email notifications.
Email Item Limit	The maximum number of messages that will be sent in a single email at the end of each interval. If more messages than the limit arrive, they are ignored.
Email From	The name you use in the 'From' line in the email header.
Email Prefix	A string prepended to every subject line of each outgoing email. This string can be used to assist with mail filtering.

### User Email Preferences

Each user that logs in to the Cluster Manager web interface can configure which mail notifications to receive. By default, a user receives no email notifications.

For users to configure their own mail notifications (for messages and build completions), they must have Modify permission defined in the User field on the Permissions page. The administrator can edit a user's permission on the Administration > Permissions page. By default, the User field is set to None.

To receive notifications about messages in the message log:

1. Go to the Messages > Message Policies page.
2. Select the Watch Messages checkbox to enable message notifications. Watch Level controls the minimum severity level of messages that generate a notification.

To receive notifications when builds complete, go to the Builds > Build Classes page. For each build class in the list, select the checkbox in the Notify column to control whether the current user is notified when a build of that class completes. Users can selectively enable notifications for a set of build classes that interest them.

## Adding Custom Protocol Mismatch Error Text

You can insert custom error text that is displayed when there is a protocol mismatch.

1. Go to the `accelerator.properties` file.
2. Add your custom text to the `ACCELERATOR_CLIENT_MISMATCH_DETAIL` property.
3. Restart the Cluster Manager service.

For more information, see [Stopping, Starting, or Restarting the Cluster Manager Service](#).

## Using the Database Connection Monitor

You can configure the Cluster Manager to monitor the connection to the database. The following properties in `accelerator.properties` control the monitor's behavior:

- `ACCELERATOR_DB_WATCHDOG_FAILURE_THRESHOLD=3`

By default, if the database connection fails three times in a row, the server is restarted. You can change the threshold to a number that meets your needs. Changing the threshold to 0 turns off database connection monitoring.

- `ACCELERATOR_DB_WATCHDOG_INTERVAL=20000`

By default, the monitor check the database connection every 20000 milliseconds (20 seconds). You can change the threshold to an interval that meets your needs.

## Configuring Agent Log Rotation

Accelerator automatically rotates session logs using default settings. The session log naming conventions and rotation behaviors are as follows:

- stdout or stderr logs go to `consoleN.log` (where *N* is the agent number).
- Normal session trace messages go to `ecagentN.log` (where *N* is the agent number).
- Only session trace logs will be rotated.
- The default size limit for log files before being rotated is 1 GB.
- The default number of rotated files to keep is 20. When that limit is reached, the oldest log files will begin to be deleted to make space for newer logs.
- The most recent log messages are in `ecagentN.log`. When the log file reaches its size limit, that file is renamed to `ecagentN.log.1`. If `ecagentN.log.1` already exists, then it is renamed to `ecagentN.log.2` before `ecagentN.log` is renamed to `ecagentN.log.1`. If `ecagentN.log.2` exists, it is first renamed to `ecagentN.log.3` and so on. This rotation continues until the retain count is met, at which point file deletion begins.



To configure agent log rotation, you edit the `runagent.local` file:

1. Navigate to the `<ECloud install>\<arch>\bin` directory.
2. Open the `runagent.local` file. If this file does not already exist, you must create it. This file uses Tcl script syntax.
3. Add the desired options using this format: `session logger <option>`

For example: `session logger retaincount 10`

Available log rotation options:

Option	Description
<code>maxfilesize &lt;bytes&gt;</code>	Get or set the maximum file size for log files before they are rotated. The default is 1 GB.
<code>filename &lt;path&gt;</code>	Get or set the file name to log to. The default for UNIX is <code>/var/log/ecagentN.log</code> . The default for Windows is <code>&lt;install_dir&gt;\ecagentN.log</code> (for example, <code>C:\ECloud\ecagentN.log</code> ).
<code>retaincount &lt;count&gt;</code>	Get or set the number of rotated log files to retain before starting to delete them. The default is 20. To turn off log rotation, set to 0.
<code>clear</code>	Clear the contents of the <code>ecagentN.log</code> file. This is useful when log rotation is turned off.

## Changing the Disk Cache Directory and Agent Temporary Storage Location

The same location is used for the disk cache directory and agent temporary storage.

You can use one of two methods.

- Use the agent's `ecconfig` command to change the location for one agent:

```
ecconfig -tempdir <newtempdir>
```

where `<newtempdir>` is the new directory.

- Run the `clusterexec` command on either the Cluster Manager or the build server to change all agents at once:

```
clusterexec --cm=<YOURCM> ecconfig -tempdir <newtempdir>
```

where:

- `<YOURCM>` is your Cluster Manager host name
- `<newtempdir>` is the new directory. Specify a full `PATH` to the directory that you want to use. Each agent on the host creates a unique subdirectory within the disk cache/temporary storage location, so that they do not conflict with each other. The path specified for `-tempdir` must already exist. On Linux and UNIX, the path must have permissions that let build users create temporary files. Also, on Linux or Solaris, this directory must not be a symbolic link. On Windows, agent users must have permission to create temporary files, because the eMake client user is not impersonated.

Then you must restart the agents for your changes to take effect:

```
clusterexec --cm=<YOURCM> restartAgent
```

After specifying a different disk cache/temporary storage location, you can switch back to the default location at any time. To do this, use `ecconfig -tempdir` with an empty string `[""]` as the location.

## Default Directories

### Installation Location

Platform	Location
Linux	/opt/eccloud/i686_Linux
Windows	C:\ECloud\i686_win32
Solaris SPARC	/opt/eccloud/sun4u_SunOS
Solaris x86	/opt/eccloud/i686_SunOS5.10

### Log Files

Platform	Install Log	Agent Log
Linux	/opt/eccloud/install_\${timestamp}.log	/var/log/ecagent?.log
Windows	C:\ECloud\install_\${timestamp}.log	<ECloud Install>\ecagent?.log
Solaris SPARC	/opt/eccloud/install_\${timestamp}.log	/var/log/ecagent?.log
Solaris x86	/opt/eccloud/install_\${timestamp}.log	/var/log/ecagent?.log

Where:

- ? is the agent number
- <ECloud Install> is the installation directory

### Disk Cache Directory and Agent Temporary Storage Location

The same location is used for the disk cache directory and agent temporary storage.

Platform	Location
Linux	/tmp
Windows	C:\WINDOWS\Temp
Solaris SPARC	/tmp
Solaris x86	/tmp

The most common reason to change this location is because of insufficient disk cache space. To change the location, see [Changing the Disk Cache Directory and Agent Temporary Storage Location](#).

## Logging In and Enabling Licensing

### About the License File

Your Accelerator license determines the usage to which you are entitled. If you have not received your license file, contact Electric Cloud technical support. For contact information, see <http://electric-cloud.com/support>.

The license file includes the expiration date, grace period, maximum number of agents, maximum number of builds that may take place concurrently, and maximum number of builds that may simultaneously use the JobCache feature. The Cluster Manager reads the information that it displays about your license from the last-imported license file.

### JobCache Licensing

JobCache can substantially reduce compilation time. It uses a separate property in the license file.

The maximum number of builds that may use it simultaneously is read from the `jobcacheMax` property in the license file. For first-time installations of Accelerator or most upgrades to Accelerator 9.1, this number is equal to the number of concurrent builds. Simultaneous builds in excess of this number will occur without using this feature.

If the JobCache license is invalid, or if the number of simultaneous builds has exceeded the license limit, a `WARNING EC1181: Your license does not permit object caching message` appears when a build tries to use JobCache. eMake will continue to work normally.

### Concurrent Builds Licensing

The number of builds that may occur simultaneously is controlled by a separately purchased license. This number is read from the `concurrentBuilds` property in the license file. Any simultaneous build in excess of this number is added to a queue and will resume when another build stops running. If there is no `<concurrentBuilds>` property, or if the property is present but the string is `unlimited`, then the Cluster Manager places no limit on the number of concurrent builds.

If the concurrent builds license is invalid, or if the number of simultaneous builds has exceeded the license limit, a `WARNING EC1321: No build license available, waiting... message` appears. A `WARNING EC1322: Build license allocated, proceeding. message` appears when a build in the queue acquires a concurrent build license.

### Server License File Example

```
<?xml version="1.0" encoding="UTF-8"?>

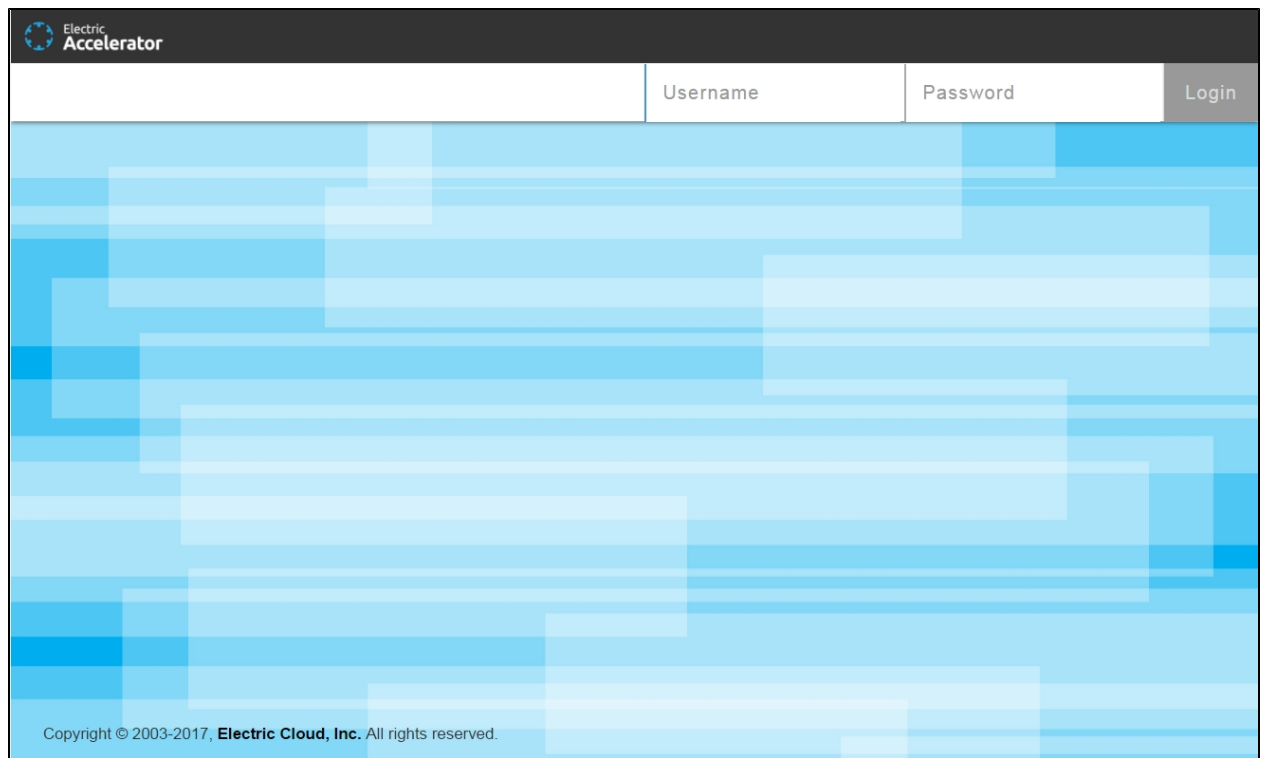
<licenses>
 <license>
 <customerName>Electric Cloud, Inc.</customerName>
 <productName>ElectricAccelerator</productName>
 <featureName>Server</featureName>
 <expirationDate>2017-09-30</expirationDate>
 <gracePeriod>0</gracePeriod>
 <evaluation>false</evaluation>
 <properties>
 <property>
 <propertyName>maxAgents</propertyName>
 <propertyValue>128</propertyValue>
 </property>
 <property>
 <propertyName>jobcacheMax</propertyName>
```

```
<propertyValue>5</propertyValue>
</property>
<property>
 <propertyName>concurrentBuilds</propertyName>
 <propertyValue>5</propertyValue>
</property>
</properties>
<signature><signature></signature>
</license>
</licenses>
```

For details about the properties in the license file, see the “License File Property Descriptions” section in the “Licenses” topic in the *ElectricAccelerator Help* at [http://documentation.electric-cloud.com/html/accelerator\\_doc/AcceleratorIndex.html](http://documentation.electric-cloud.com/html/accelerator_doc/AcceleratorIndex.html).

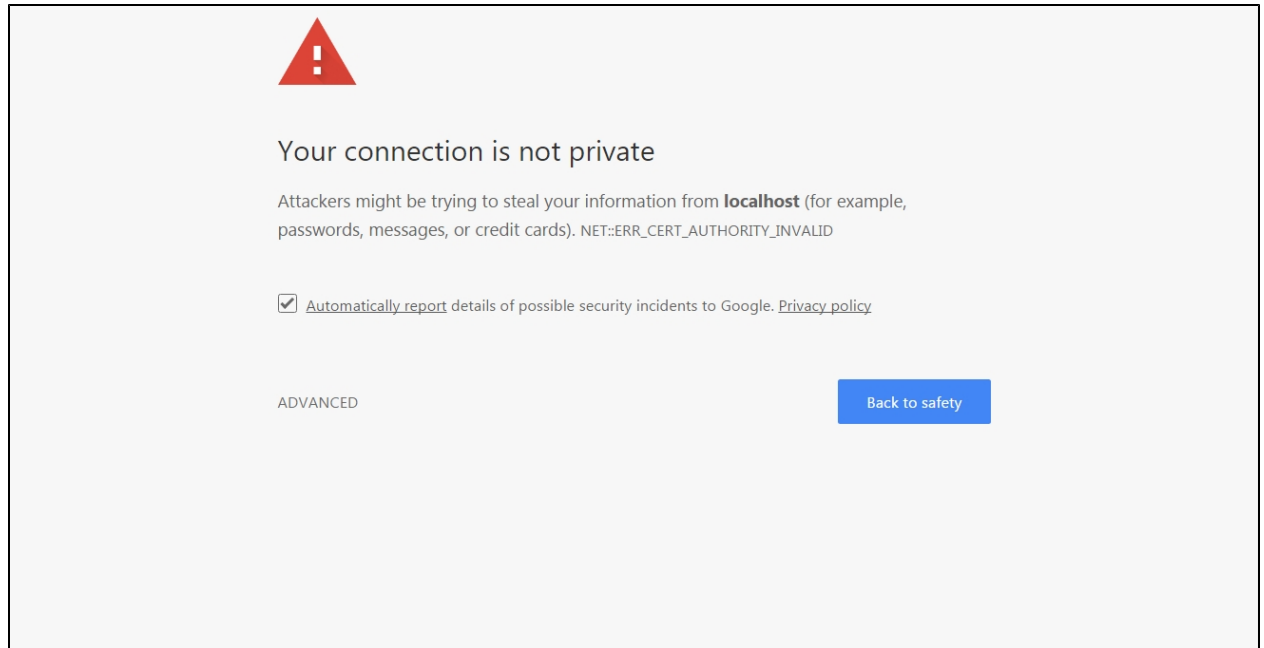
## Importing Your License

1. From the machine where the Cluster Manager is installed, open a browser window and type in `localhost` to display the **Login** page. If you are accessing the Cluster Manager machine remotely, type in the machine name, *not* `localhost`. If you are not using port 80, use `<host>:<port>`. The login page appears:



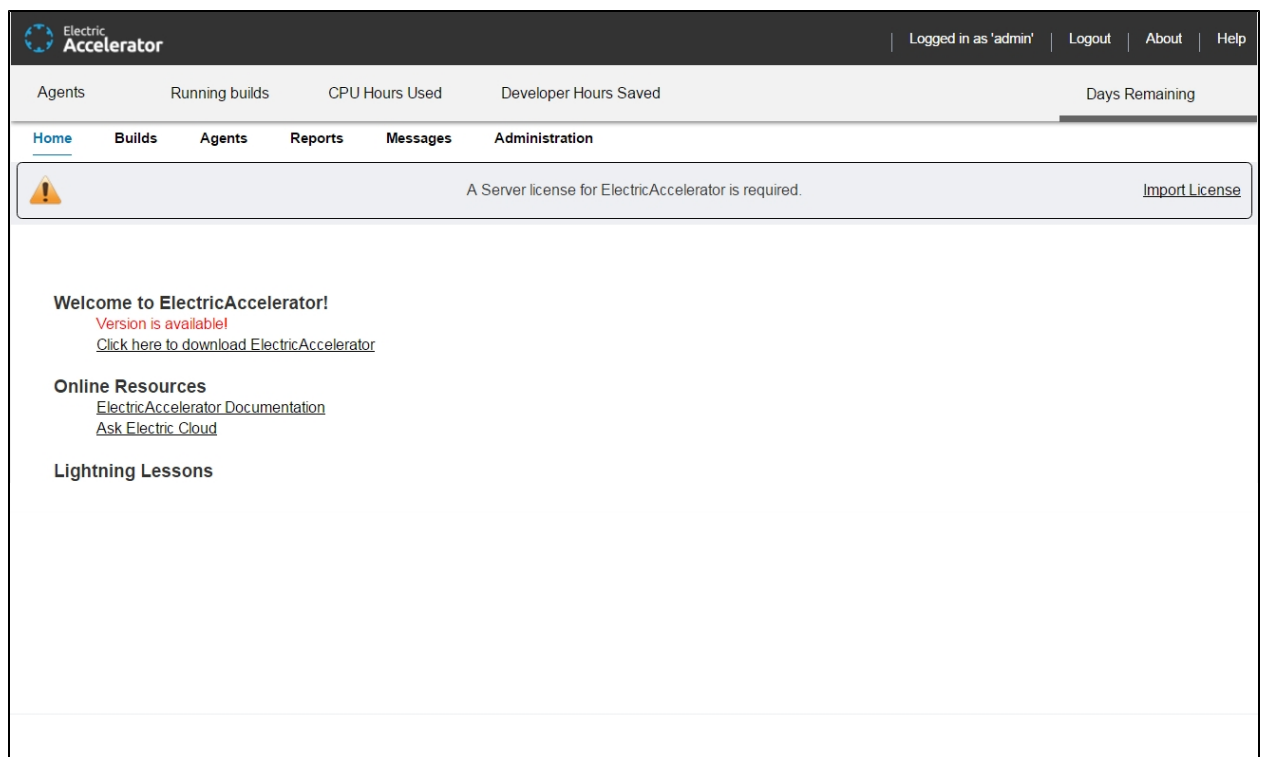
2. Type in your user name and password. For a new installation, the default administrator account user name and password are `admin` and `changeme` respectively. For an upgrade, the default administrator account user name and password are `admin` and `<previous_password>` respectively.

- Click **Login**. A security warning page appears because a web server certificate is not yet installed. Following is an example in the Chrome browser:



For details about installing a server certificate, see [Installing an Apache Server Certificate](#)

- Follow the prompts to proceed to the Cluster Manager **Home** page. If you have not installed an Accelerator license, an A Server license for ElectricAccelerator warning appears:



5. Click **Import License**. The **Import License** page appears:

The screenshot shows the ElectricAccelerator web interface. At the top, the header includes the ElectricAccelerator logo and navigation links: Home, Builds, Agents, Reports, Messages, and Administration (which is highlighted). Below the header, there is a sub-navigation bar with links: Permissions, Users, Groups, User Settings, Server Settings, Database Configuration, and Licenses. A yellow warning icon is present next to a message: "A Server license for ElectricAccelerator is required." with a link to "Import License". The main content area is titled "Import License". It contains a "License File:" section with a "Choose File" button and the text "No file chosen". To the right of this section is an "Upload File" button. Below this is a "Data:" section with a large text area for pasting license information. At the bottom right of the page are "OK" and "Cancel" buttons.

6. Use one of the following methods to install your license:
- Click **Choose File** to browse for your license file, then click **Upload File**, and then click **OK**.
  - Open your license file, then copy and paste the text in to the **Data** field, and then click **OK**.

For example, a license file named license.xml is chosen in the following page:

The screenshot shows the 'Import License' form in the ElectricAccelerator web interface. The top navigation bar includes 'Home', 'Builds', 'Agents', 'Reports', 'Messages', and 'Administration' (which is active). Under 'Administration', there are links for 'Permissions', 'Users', 'Groups', 'User Settings', 'Server Settings', 'Database Configuration', and 'Licenses'. The form has a 'License File:' label with a 'Choose File' button and the text 'license.xml'. An 'Upload File' button is on the right. Below is a 'Data:' label followed by a large text area for pasting license details. At the bottom right are 'OK' and 'Cancel' buttons.

The **Licenses** page appears. It displays the details about the license that you imported. For example:

The screenshot shows the 'Licenses' page in the ElectricAccelerator web interface. The top navigation bar is the same as the previous screenshot. The 'Licenses' section has a '+ Import License' button. Below is a table with the following data:

Product Name	Feature Name	Customer Name	Grace Period (days)	Expiration Date	Max Agents	Concurrent Builds Max	Jobcache Max	Actions
ElectricAccelerator	Server	Electric Cloud, Inc.	0	2017-09-30	128	5	2	

Below the table, it shows '1 thru 1' and a 'Go' button. At the bottom left, the URL 'https://localhost/accelerator/home.php' is displayed.

This example uses the license file in the [Server License File Example](#) section above.

After the Accelerator license is imported, you can get familiar with home page features, complete the remaining [Configuring ElectricAccelerator](#) tasks such as installing a server certificate, and begin using Accelerator.

## Enabling Resource Management

ElectricAccelerator resource managers allow you to select a subset of available agents to run builds. The following resource management choices are available:

- none - do not use a resource manager (default).
- built in - use Accelerator's internal resource manager. For example, you might have a build that requires a certain hardware feature. If so, you can instruct Accelerator to use agents on hosts only containing that hardware.
- priority pool - use the priority pool resource manager, which allows you to group resources into pools that can be prioritized differently among groups.
- grid - for use with grid management software, such as LSF or Oracle Grid Engine.

**Note:** You might choose not to use the resource manager feature, but if you use this feature, note that choosing one resource manager precludes using the other one—resource managers are mutually exclusive.

To enable a resource manager for your build:

1. Log in to the Cluster Manager.
2. Go to Administration > Server Settings.
3. Select a resource manager.

Enabling resource management provides an additional subtab in the web UI. From any Cluster Manager page, click the Agents tab to see the newly activated Resources subtab. Accelerator's online help system contains more resource manager information and help for using the Resources and the Resource Details topics.

### If you selected grid...

After you complete the installation process and perform the steps in [Configuring LSF](#) (if applicable) and [Enabling Grid Host Manager](#):

1. Restart the Cluster Manager service.  
For more information, see [Stopping, Starting, or Restarting the Cluster Manager Service](#).
2. Log in as an administrator.
3. Go to Administration > Server Settings.

If everything is available, the grid radio button will be accessible. If this button is not available, review the Accelerator Log file—LSF, for example, might not be available to the process running the ElectricAccelerator server.

4. If the grid radio button is available, select it.

The Cluster Manager will dynamically request hosts as needed to support running Electric Make.

**IMPORTANT:** If using LSF, the LSF client must be installed on the Cluster Manager host.

## Stopping, Starting, or Restarting the Cluster Manager Service

To apply any changes that you made in the `accelerator.properties` file, you must restart the Cluster Manager service. These changes include disabling agents by default, enabling LDAP or Active Directory authentication, setting up email notification, adding custom protocol mismatch error text, reconfiguring the database connection monitor settings, and enabling resource management.



You must also restart the service if you use a MySQL or Oracle database and have installed the JDBC driver for that database.

## Red Hat Enterprise Linux

1. Log in as root.
2. Stop, start, or restart the service.
  - To stop the service, enter `service clustermanager stop`.
  - To start the service, enter `service clustermanager start`.
  - To restart the service, enter `service clustermanager restart`.

## SUSE Linux Enterprise Server

1. Log in as root.
2. Stop, start, or restart the service.
  - To stop the service, enter `/etc/init.d/clustermanager stop`.
  - To start the service, enter `/etc/init.d/clustermanager start`.
  - To restart the service, enter `/etc/init.d/clustermanager restart`.

## Ubuntu Linux

1. Log in as root.
2. Stop, start, or restart the service.
  - To stop the service, enter `/etc/init.d/clustermanager stop`.
  - To start the service, enter `/etc/init.d/clustermanager start`.
  - To restart the service, enter `/etc/init.d/clustermanager restart`.

## Windows

### *Using the Windows Command Line*

1. Log in as an administrator.
2. Open a command prompt.
3. Stop, start, or restart the service.
  - To stop the service, enter `net stop "ElectricAccelerator Cluster Manager"`.
  - To start the service, enter `net start "ElectricAccelerator Cluster Manager"`.
  - To restart the service, enter `net stop "ElectricAccelerator Cluster Manager" && net start "ElectricAccelerator Cluster Manager"`.

### *Using the Windows Services Console*

1. Log in as an administrator.
2. Open a command prompt and enter `services.msc`.

The Services console appears.

3. Stop, start, or restart the service.
  - To stop the service, click **ElectricAccelerator Cluster Manager** and click **Stop**.
  - To start the service, click **ElectricAccelerator Cluster Manager** and click **Start**.
  - To restart the service, click **ElectricAccelerator Cluster Manager** and click **Restart**.

## Installing an Apache Server Certificate

After installation, you might want to create a new Apache certificate.

By default, Accelerator generates a temporary self-signed certificate during installation. This certificate is used whenever a browser makes an HTTPS connection to the Apache server. During Accelerator installation, Apache is configured to look for a private key file named `$HOSTNAME.key` and a certificate named `$HOSTNAME.crt`. These files are in `$DATADIR/apache/conf/ssl.key` and `$DATADIR/apache/conf/ssl.crt` respectively. `$DATADIR` is the directory where Accelerator data files were installed. On Windows, these files are in `C:/ECloud/i686_win32`.

Because the certificate is self-signed, browsers complain that it is an untrusted certificate. Most organizations will want to generate a new certificate signed by a recognized certificate authority (CA) to avoid the browser warnings. The following list summarizes the process:

1. Generate a new certificate and private key
2. Send the request to the CA
3. Install the signed certificate

## Generating a New Certificate and Private Key

1. Locate `openssl` binary and `openssl.cnf` in `$DATADIR/apache/bin/ssl`.
2. Copy `openssl.cnf` into a temporary directory.
3. Generate a new private key and certificate.
4. Enter the appropriate information for your organization when prompted.

The most important field is the Common Name, which is the fully qualified name of the host running the Apache server where you want the certificate. This name must match the host portion of the URL used to connect to the Cluster Manager.

```
$ openssl req -config openssl.cnf -new -out $HOSTNAME.csr
Loading 'screen' into random state - done
Generating a 1024 bit RSA private key
.....++++++
.....++++++
writing new private key to 'privkey.pem'
Enter PEM pass phrase:
Verifying - Enter PEM pass phrase:

You are about to be asked to enter information that will be incorporated into yo
ur certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields, but you can leave some blank.
For some fields, there will be a default value, if you enter '.', the field will
remain blank.

Country Name (2 letter code) []:US
State or Province Name (full name) []:California
```

```
Locality Name (eg, city) []:Sunnyvale
Organization Name (eg, company) []:Electric Cloud
Organizational Unit Name (eg, section) []:
Common Name (eg, your websites domain name) []:myserver.mycompany.com
```

```
Email Address []:user@mycompany.com
```

**Note:** This is the email address the user would contact if there are issues concerning the certificate.

Please enter the following 'extra' attributes to be sent with your certificate request.

A challenge password []:

This information generates a new private key in `privkey.pem` and a signing request in `$HOSTNAME.csr`.

If you want to use the private key without having to enter a challenge password each time the server starts, issue the following command to strip out the password:

```
$ openssl rsa -in privkey.pem -out $HOSTNAME.key
Enter pass phrase for privkey.pem:
writing RSA key
```

This creates a PEM encoded private key file named `$HOSTNAME.key` without the password.

## Sending the Request to the CA

The `$HOSTNAME.csr` file generated in the previous section is a request for a certificate authority to sign the certificate. When you send this file to the CA, the CA verifies the information inside and sends you a signed certificate in response. The signed certificate includes the original certificate and the signature of the CA. Name the signed certificate '`$HOSTNAME.crt`'.

## Installing the Key and Signed Certificate

1. Copy the two files, `$HOSTNAME.key` and `$HOSTNAME.crt`, into `$DATADIR/apache/conf/ssl.key` and `$DATADIR/apache/conf/ssl.crt`.
2. Restart the Apache server.

Ensure the `$HOSTNAME.key` file is readable only by the user running the Apache server process.

3. Delete the contents of the temporary directory you created because this directory contains the cryptographic information used to generate the key.

## Configuring LSF

After you install the Cluster Manager:

1. Log in with the Cluster Manager Service User ID (fully enabled to start and stop LSF jobs).
2. Run a sample LSF job to make certain the user ID is ready.

```
bsub -u myemail@mycompany.com -x -q <queueName> -J <jobName> ls
```

If the job runs and results are returned, the user ID should be appropriate to use for Cluster Manager. (If the appropriate result is not returned, you might need to restart the server after making the necessary changes.)

3. Update the Accelerator properties file in the `conf` directory. Edit the following entries in the `accelerator.properties` file:

## Setting the Agent Connect Script Initial Wait Interval

Use this option when the `agentconnect` script is run. The value is the number of seconds a host waits for agents to be activated and assigned to a build. The typical setting is between 10 and 60 seconds. A short setting might not allow enough time for LSF to schedule the job and start the agents. A setting too long and hosts that will never be used can tie up resources.

```
HM_LSF_INITIAL_WAIT=30
```

## Setting the Agent Connect Script Idle Host Interval

This option identifies LSF hosts that are no longer needed. When the ElectricAccelerator Cluster Manager sees a host unused for the number of seconds specified in this setting, it cancels the corresponding LSF job. Typical values for this setting are between 3 and 30 seconds. Use a longer setting if your LSF grid is continuously using ElectricAccelerator.

```
HM_LSF_IDLE_HOST_TIME=5
```

## Setting the Agent Connect Script NotFound Job Cleanup Interval

Use this option to clean up LSF jobs reported as “NOTFOUND” for the number of seconds specified as the value. There is a case in LSF that queries the LSF job against `mbatchd` and returns a “job is not found” result when actually the job is still running. Without this setting, Cluster Manager treats “NOTFOUND” as an invalid status and removes the job on the Cluster Manager side. This action leads to LSF job synchronization issues.

The typical value for this setting is a few seconds more than the value of `MBD_REFRESH_TIME` if you are using multi-threading `mbatchd` mode. If you do not encounter the “NOTFOUND” problem, Zero value for this setting means the “NOTFOUND” status is treated as an invalid status and the job is removed from the Cluster Manager immediately.

```
HM_LSF_NOTFOUND_KILL_TIME=15
```

## Setting the Agent Connect Script Maximum Number of Pending Jobs

Use this option to limit the number of jobs the Cluster Manager will leave in a pending state. This option has a distinct impact on your overall build throughput. While builds are running and could use more Accelerator agents for parallel processing, Cluster Manager leaves jobs in the LSF queue in case more hosts become available. The typical setting is 2. If software builds are important and hosts become available quickly, a setting of 5 might be appropriate.

```
HM_LSF_MAX_PENDING_REQUESTS=2
```

## Creating a Queue

There must be a queue that allows the Cluster Manager to submit host exclusive jobs or a queue that specifies `HJOB_LIMIT=1`.

1. Create a queue that limits jobs to the host group.
2. Edit the `conf/lsbatch/xxxx/configdir/lsb.queues` file.

Example queue definition that allows exclusive jobs and limits those jobs to Electric Agent/EFS hosts:

```
Begin Queue
QUEUE_NAME = eaQueue
EXCLUSIVE = Y
HOSTS = eaGroup
DESCRIPTION = Queue to control ElectricAccelerator agents.
End Queue
```

**Note:** If you use the exclusive method, the `-x` option after the `bsub` command is required in `submitJob.tcl`. The `-x` option is not required when using `HJOB_LIMIT = 1`.

Example queue definition that is NOT exclusive:

```
Begin Queue
QUEUE_NAME = eaQueue
EXCLUSIVE = N
HJOB_LIMIT = 1
HOSTS = eaGroup
DESCRIPTION = Queue to control ElectricAccelerator agents.
End Queue
```

If `EXCLUSIVE = N`, jobs from another queue might also run on the same host.

You might want to consider imposing limits on Accelerator's use of the grid. LSF queue definitions provide a variety of controlling features. For example, you can limit how many hosts are available to Accelerator during certain time periods. See your LSF Administrator's Guide for more information.

## Additional Information

Ensure you have a standard way to construct the LSF resource query string. If not, you might encounter an issue illustrated by the following example:

If the LSF query condition is `CPU > 8` and `OS = windows`:

User1 might put `--emake-resource="cpu>8&&OS==windows"` while User2 might put `--emake-resource="OS==windows&&cpu>8"` (which is the same resource defined in a different order).

The Cluster Manager handles these as two different resources, but LSF handles them as the same resource.

The issue manifests in this manner: If you submit two builds with the same LSF resource query string (the same CPU arch OS ...), the builds do not appear to share the started agents and they act as totally different builds with two separate resources. In the UI, you can identify the issue by hovering the cursor over the Builds page agent bars and seeing a different "Allocated" number for these two builds. If they are on the same resource, the "Allocated" value for both builds would be the same and they would share the agents fairly.

## Enabling Grid Host Manager

Grid Host Manager allows Accelerator to communicate and integrate with a host grid such as LSF or Oracle Grid Engine. You must enable Grid Host Manager using `cmtool`:

```
cmtool modifyServer --resourceManagerType cloud
```

After you enable Grid Host Manager, the following scripts become available so you can communicate with the host grid server.

Script	Description	Input argument	Output
<code>checkResource.tcl</code>	Checks whether a resource string is valid.	Resource string in "bsub -R" (same as in <code>--emake-resource</code> )	"true" if the string is valid, "false" otherwise.
<code>initialize.tcl</code>	Checks whether the grid setup is ready (for example, already "source <code>profile.lsf</code> " from LSF, can run <code>b*</code> commands, and so on)	none	"true" if the grid setup is ready and initialized, "false" otherwise.

Script	Description	Input argument	Output
killJob.tcl	Kills a grid job based on job ID.	Grid job ID	none
queryJobs.tcl	Queries the status of all grid jobs	none	A string format: job1Id:host1: status, job2Id:host2: status, job3Id:host: status...
submitJob.tcl	Submits a grid job	Resource string, OS, host:port of the Cluster Manager	Grid job ID

## Grid Host Manager Examples

### checkResource.tcl

```
returns "true" if the resource is correct, "false" otherwise.

define all the variables
set executable "lshosts"
set resource [lindex $argv 0]
set timestamp [clock format [clock seconds] -format {%Y-%m-%d %I:%M:%S %p}]
set log "$timestamp: $executable $resource"

main program
if { ![catch { exec $executable -R $resource } output] } {

 # logging the output
 exec echo "$log\n$output" >> cloud/cloud.log

 if [regexp {Unknown resource} $output match id] {
 puts -nonewline "false"
 } else {
 puts -nonewline "true"
 }
} else {
 # logging the error
 exec echo "$log\n$output\n$::errorInfo" >> cloud/cloud.log

 puts "error in executing $executable"
 puts $::errorInfo
 exit 1
}
```

### initialize.tcl

```
returns "true" if the cloud is setup correctly, "false" otherwise.

set timestamp [clock format [clock seconds] -format {%Y-%m-%d %I:%M:%S %p}]
set log "$timestamp: initial cloud setup check"
```

```
exec echo "$log" >> cloud/cloud.log
puts -nonewline "true"
```

## submitJob.tcl

```
submitJob.tcl - submit jobs in the cloud setup e.g. LSF/SGE
#
this script accepts three arguments:
1. resource - for bsub -R <resource>
2. os - for LSF to invoke agentConnect in different paths under different
OSes.
3. host:port - the argument for agentconnect

define all the variables
set executable "bsub"
set resource [lindex $argv 0]
set hostport [lindex $argv 2]
set queue "eaQueue"
switch [lindex $argv 1] {
 "linux" { set agentConnect "/opt/ecloud/i686_Linux/bin/agentconnect" }
 "windows" { set agentConnect "c:\\ecloud\\i686_win32\\bin\\agentconnect" }
 "solaris" { set agentConnect "/opt/ecloud/sun4u_SunOS/bin/agentconnect" }
 "solarisx86" { set agentConnect "/opt/ecloud/i686_SunOS.5.10/bin/agentconnect" }
 default { exit 1 }
}

set timestamp [clock format [clock seconds] -format {%Y-%m-%d %I:%M:%S %p}]
set log "$timestamp: $executable $resource [lindex $argv 1] $hostport"

main program
if { ![catch { exec $executable -R $resource -q $queue $agentConnect $hostport } output] } {
 # logging the output
 exec echo "$log\n$output" >> cloud/cloud.log

 if [regexp {Job <(\d+)>} $output match id] {
 puts $id
 } else {
 puts $output
 exit 1
 }
} else {
 # logging the error
 exec echo "$log\n$output\n$::errorInfo" >> cloud/cloud.log

 puts "error in executing $executable"
 puts $::errorInfo
 exit 1
}
```

## queryJobs.tcl

```
queryJobs.tcl - query jobs status in the cloud setup e.g. LSF/SGE
#
this script needs to return the following format:
job1Id:host1:status,job2Id:host2:status,job3Id:host:status...
```

```
define all the variables
set executable "bjobs"
set queue "eaQueue"
set status(PEND) "pending"
set status(PSUSP) "pending"
set status(SSUSP) "pending"
set status(USUSP) "pending"
set status(RUN) "running"
set status(DONE) "end"
set status(EXIT) "failed"
set status(UNKWN) "failed"
set status(ZOMBI) "end"

set timestamp [clock format [clock seconds] -format {%Y-%m-%d %I:%M:%S %p}]
set log "$timestamp: $executable"

main program
set result ""
if { ![catch { exec $executable -q $queue } output] } {
 # logging the output
 exec echo "$log\n$output" >> cloud/cloud.log

 if [regexp {JOBID\s+USER} $output] {
 # split the lines into a list
 set data [split $output "\n"]

 # parse the first line to get all the indices
 set line [lindex $data 0]
 set idStart 0
 set idEnd [expr [string first USER $line] - 1]
 set statStart [string first STAT $line]
 set statEnd [expr [string first QUEUE $line] - 1]
 set hostStart [string first EXEC_HOST $line]
 set hostEnd [expr [string first JOB_NAME $line] - 1]

 # remember to ignore the first line
 foreach line [lrange $data 1 end] {
 # do some line processing here
 append result [string trim [string range $line $idStart $idEnd]]:
 append result [string trim [string range $line $hostStart $hostEnd]]:
 append result [set status([string trim [string range $line $statStart
$statEnd]])],
 }

 # trim the last comma
 set result [string trimright $result ,]
 } else {
 exit 1
 }
} else {
 exec echo "$log\n$output" >> cloud/cloud.log

 if { ![regexp {No unfinished job found} $output] } {
 # logging the error
 exec echo $::errorInfo >> cloud/cloud.log

 puts "error in executing $executable"
 puts $::errorInfo
 exit 1
 }
}
```



```
 }
 }

 puts $result
```

### killJob.tcl

```
killJob.tcl - kill jobs in the cloud setup e.g. LSF/SGE

this script accepts one argument:
id: for bkill <id>

define all the variables
set executable "bkill"
set id [lindex $argv 0]
set timestamp [clock format [clock seconds] -format {%Y-%m-%d %I:%M:%S %p}]
set log "$timestamp: $executable $id"

main program
if { ![catch { exec $executable $id } output] } {
 # logging the output
 exec echo "$log\n$output" >> cloud/cloud.log

 if [regexp {Job <(\d+)> is being terminated} $output match id] {
 exit 0
 } else {
 puts $output
 exit 1
 }
} else {
 # logging the error
 exec echo "$log\n$output\n$::errorInfo" >> cloud/cloud.log

 puts "error in executing $executable"
 puts $::errorInfo
 exit 1
}
```

## Documentation Roadmap

The following list is an overview of more product information and help.

- *ElectricAccelerator Electric Make User Guide* ([http://docs.electric-cloud.com/accelerator\\_doc/AcceleratorIndex.html](http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html)) includes
  - Configuring Accelerator, defining your build, and configuring sources and tools
  - Starting a build; eMake settings and options
  - Organizing builds; build classes
  - Make compatibility, output, and support
  - Third-party integration products, including Rational ClearCase, Cygwin, and Eclipse
  - Dependency management, including eDepend, the Ledger file, and managing the history data file
  - Annotation
  - Performance tuning, managing files, and running multiple agents
  - eMake command-line options and environment variables

- Using Electrify
- Help available within the Accelerator product includes
  - Online help available from the Help link on each web page
  - Online help describes what to type in web page fields (accessed by clicking the Show/Hide links)
- *ElectricAccelerator cmtool Reference Guide* ([http://docs.electric-cloud.com/accelerator\\_doc/AcceleratorIndex.html](http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html)) includes
  - An introductory chapter to familiarize you with cmtool—the Accelerator command-line tool application
  - A complete list of cmtool commands and arguments
- *ElectricAccelerator Visual Studio Integration Guide* ([http://docs.electric-cloud.com/accelerator\\_doc/AcceleratorIndex.html](http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html)) includes
  - List of what's new with each release
  - System requirements, installation, and setup
  - Building Visual Studio solutions and projects from within the Visual Studio IDE using eMake
  - Debugging failed builds and troubleshooting problems
- *ElectricAccelerator Release Notes* ([http://docs.electric-cloud.com/accelerator\\_doc/AcceleratorIndex.html](http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html)) includes
  - Latest feature changes, fixes, and known issues
  - Installation and upgrade notes
- The Electric Cloud technical support site (<https://electriccloud.zendesk.com/home>) includes
  - Knowledge base articles
  - User forums
- The Electric Cloud “Ask” site (<http://ask.electric-cloud.com>) lets you
  - Ask questions
  - Get help with installation and configuration

## Chapter 5: Upgrading ElectricAccelerator

You can upgrade the software using a GUI or an interactive command-line interface (for Linux and Solaris), or by using a "silent" installation.

Not all instructions are the same for each platform. Follow the instructions carefully for your platform.

- [Upgrading ElectricAccelerator on Linux or Solaris](#)
- [Upgrading ElectricAccelerator on Windows](#)
- [ecclusterupgrade Options](#)

## Upgrading ElectricAccelerator on Linux or Solaris

**IMPORTANT:** Installing a component overwrites the entire installation on that machine. Only one Accelerator installation can exist on a machine, which is the combination of components that are in the most recent installation. For example, installing the Cluster Manager on a machine with the Electric Agent results in a machine with the Cluster Manager only, not a machine with the Electric Agent and the Cluster Manager.

You can install the Cluster Manager and agents at the same time on the same machine.

### Upgrading the Cluster Manager

**Notes:**

- The Cluster Manager server and agent hosts must run the same version of Accelerator.
- If you want to upgrade the Cluster Manager *and* migrate the database to a different machine, you must first upgrade the Cluster Manager (to update the existing database's schema), then migrate the database to the new machine.
- The remote database configuration upgrade might trigger a warning. The Cluster Manager can connect to a remote database, and the user can shut down the local database (if applicable).

During the upgrade, the installer cannot reach the local database (because it is shut down already), so it gives this prompt:

```
Unable to contact the database. Please enter a correct username/password:
Root User (empty=no database migration):
```

Leaving the value empty lets the installer finish. Upon completion, a warning message appears. This is the expected behavior and does not indicate a problem.

- The duration of the database schema upgrade might trigger an extraneous failure message. During an ElectricAccelerator upgrade, the installer attempts to connect to the Cluster Manager. Because the Cluster Manager handles the database schema upgrade, a large database might cause the Cluster Manager to take a long time to finish the upgrade.

A failure message stating that the Cluster Manager failed to start might appear. This message does not indicate an actual failure and means only that the Cluster Manager is still processing the schema upgrade. The Cluster Manager will load after the schema upgrade completes.

- To back up and restore your database, use the `exportData` and `importData` cmtool commands as described in the *ElectricAccelerator cmtool Reference Guide* at [http://docs.electric-cloud.com/accelerator\\_doc/AcceleratorIndex.html](http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html).
- Electric Cloud no longer bundles MySQL as the default local database for ElectricAccelerator. Starting with ElectricAccelerator v7.1, Electric Cloud bundles MariaDB and installs it as the default local database on the Cluster Manager. When you perform a Cluster Manager upgrade, 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. As open-source software, there is no enterprise license support model available with MariaDB. If using an open-source database is of concern to your organization, you continue to have the option to use any of the following databases as a replacement: MySQL, Oracle, or SQL Server. See the online help topic "Database Configuration" for information about configuring Accelerator to use an external database.

### *Using the GUI to Upgrade the Cluster Manager*

1. Log in as root.
2. Ensure that no builds are running.
3. Copy the installer executable to the Cluster Manager machine to a location such as `/var/tmp`.  
Do *not* run the installer from a directory path that contains spaces.
4. Double-click the `ElectricAccelerator-<version>` file.  
The **Welcome** screen appears after the installation packages are extracted.
5. Proceed with the upgrade in the same way that you initially installed the Cluster Manager.  
Ensure that you type in the correct value for your Cluster Manager `admin` password. The encrypted default password is `changeme`.  
The upgrade fails if the correct password is not used. You can change the Cluster Manager `admin` password during the upgrade *only* if the current password is the default password.
6. Accept the existing Cluster Manager configuration or update your configuration settings.
7. When the **Start Copying Files** screen appears, click **Next**.  
The **Installing** screen appears. When installation is finished, the **Complete** screen appears.
8. Click **Finish**.
9. If you changed Cluster Manager ports during the upgrade, close your browser windows to avoid potential conflicts and to ensure that your settings take effect.

Installation is complete. The installation log file is in the installation directory's root by default.

**Note:** If Apache fails to start properly after the Cluster Manager installs, reboot the system.

### *Using the Interactive Command Line to Upgrade the Cluster Manager*

1. Log in as root.
2. Ensure that no builds are running.
3. Copy the installer executable (`ElectricAccelerator-<version>`) to the Cluster Manager machine to a location such as `/var/tmp`.  
Do *not* run the installer from a directory path that contains spaces.
4. Run `chmod +x` on the installer file to ensure that it is executable.
5. Enter `./ElectricAccelerator-<version> --mode console`.
6. Enter `3` to select the Cluster Manager package and then press `Enter`.
7. Enter configuration details for the upgrade.
  - Accept the default listening port that you specified during the initial Cluster Manager installation.
  - Accept the default database listening port that you specified during the initial Cluster Manager installation.
  - You can change the Cluster Manager `admin` password during the upgrade *only* if the current password is the default.
  - Migrate data from the current Cluster Manager version to preserve previously-generated data. However, if the database schema has changed significantly, migration is not possible, and a warning message is displayed.

If you want to upgrade the Cluster Manager *and* migrate the database to a different machine, you must upgrade the Cluster Manager first (to update the existing database's schema), and then migrate the database to the new machine.

The installer upgrades the Cluster Manager using the configuration details you entered, followed by Installation complete.

The installation log file is in the install directory's root, `/opt/eccloud`, by default.

## Upgrading the Electric Agent/EFS

### Notes:

- The Cluster Manager server and agent hosts must run the same version of Accelerator.
- After agents on the grid are upgraded, they do not re-register with the Cluster Manager until a build runs. This means that the Cluster Manager has old information about the agents and EFS (including outdated version information) until the next build runs and “wakes up” the agents. Initially, after an upgrade, the installation log might show that the upgrade failed, but only until the next build is run.

### Upgrading Electric Agent/EFS on Multiple Hosts Simultaneously

If you used `ecconfig` to change the Cluster Manager/port any time after you initially ran the installer, you must manually update the Cluster Manager/port (where the agent hosts point to) in `/opt/eccloud/install.props` before running `ecclusterupgrade`.

1. Log in as root.
2. Ensure that no builds are running.
3. Copy the installer executable to the Cluster Manager machine to a location such as `/var/tmp`.  
Do *not* run the installer from a directory path that contains spaces.
4. On the Cluster Manager machine, run:

```
ecclusterupgrade
```

Depending on your setup, you might need the following options as well:

- `--agentinstalldir=<path>` indicates the agents' installation location. All agents that you want to upgrade must have the same installation location. If this is not true, you must run the script multiple times using the relevant `--agentinstalldir` path names. You must also specify the `--hosts` option to limit the upgrade to machines that use the nonstandard agent installation directory.
- `--targetos=<os>` limits which operating system to upgrade. indicates which operating system to update. Available values for `<os>` are `windows`, `linux`, and `solaris`. This lets you update any operating system type from any operating system.
- `--hosts="host1 host2 ..."` specifies a list of hosts to upgrade. You can also use a pattern such as `host[1-3]`, `host[2,5]`.
- For multiple installer versions, use one of the following options:
  - `--installerversion=<version>` to select the version. You need this option only if there are multiple installer versions in the `local/<installerdir>` location.
  - `--installer=<filename>` to explicitly select an installer. Use an absolute file name for this option.

See the “[ecclusterupgrade Options](#)” for all `ecclusterupgrade` options.

Following is an example of an `ecclusterupgrade` command. This command upgrades two agents:

```
/opt/eccloud/i686_Linux/bin/ecclusterupgrade --installer=/tmp/ElectricAccelerator-7.1.1.48690-Linux-x86_64-Install --hosts="agent1 agent2"
```

### *Using the GUI to Upgrade Electric Agent/EFS on a Single Cluster Host*

1. Log in as root.
2. Ensure that no builds are running.
3. Copy the `ElectricAccelerator-<version>` installer executable to the Cluster Manager machine to a location such as `/var/tmp`.  
Do *not* run the installer from a directory path that contains spaces.
4. Double-click the executable to start the upgrade. The **Welcome** screen appears after the installation packages are extracted.
5. Click **Next** to continue.
6. Select **Electric Agent**, and then click **Next**.  
The **Electric Agent** screen is filled in with your previous configuration information. The maximum number of agents allowed on one 32-bit machine is 32; the maximum for one 64-bit machine is 64.
7. Click **Next** to continue to the next screen.
8. When the **Start Copying Files** screen appears, click **Next**.  
The **Installing** screen displays while the upgrade progresses.
9. When the **Complete** screen displays, click **Finish**.
10. Reboot the agent machine.

The installation log file is in the install directory's root, `/opt/eccloud`, by default.

### *Using the Interactive Command Line to Upgrade Electric Agent/EFS on a Single Cluster Host*

1. Log in as root.
2. Ensure that no builds are running.
3. Copy the `ElectricAccelerator-<version>` installer executable to the Cluster Manager machine to a location such as `/var/tmp`.  
Do *not* run the installer from a directory path that contains spaces.
4. Run `chmod +x` on the file to ensure that it is executable.
5. Run `./<installer filename> --mode console` to start the upgrade.
6. Enter 1 to select the `Electric Agent/EFS` package and then press `Enter`.
7. Enter configuration details for the Electric Agent/EFS upgrade.

**Note:** Use the Cluster Manager default port 8030 or type in the alternative port that you specified during the initial installation.

The installer upgrades Electric Agent/EFS using the configuration details you entered, followed by  
Installation complete.

You might receive a message to reboot the agent machine after upgrading Electric Agent/EFS—rebooting might not be required.

The installer dynamically builds the EFS kernel module if it detects no prebuilt version matching your Linux kernel version. The installation log file is in the install directory's root, `/opt/eccloud`, by default.

## Upgrading Electric Make

**Note:** If you are uninstalling Electric Make before upgrading, if Electric Make and the Cluster Manager are installed on the same machine, uninstalling Electric Make removes the Cluster Manager.

## Upgrading ElectricAccelerator on Windows

**IMPORTANT:** Installing a component overwrites the entire installation on that machine. Only one Accelerator installation can exist on a machine, which is the combination of components that are in the most recent installation. For example, installing the Cluster Manager on a machine with the Electric Agent results in a machine with the Cluster Manager only, not a machine with the Electric Agent and the Cluster Manager.

You can install the Cluster Manager and agents at the same time on the same machine.

## Upgrading the Cluster Manager

### Notes:

- The Cluster Manager server and agent hosts must run the same version of Accelerator.
- If you want to upgrade the Cluster Manager *and* migrate the database to a different machine, you must first upgrade the Cluster Manager (to update the existing database's schema), then migrate the database to the new machine.
- The remote database configuration upgrade might trigger a warning. The Cluster Manager can connect to a remote database, and the user can shut down the local database (if applicable).

During the upgrade, the installer cannot reach the local database (because it is shut down already), so it gives this prompt:

```
Unable to contact the database. Please enter a correct username/password:
Root User (empty=no database migration):
```

Leaving the value empty lets the installer finish. Upon completion, a warning message appears. This is the expected behavior and does not indicate a problem.

- The duration of the database schema upgrade might trigger an extraneous failure message. During an ElectricAccelerator upgrade, the installer attempts to connect to the Cluster Manager. Because the Cluster Manager handles the database schema upgrade, a large database might cause the Cluster Manager to take a long time to finish the upgrade.

A failure message stating that the Cluster Manager failed to start might appear. This message does not indicate an actual failure and means only that the Cluster Manager is still processing the schema upgrade. The Cluster Manager will load after the schema upgrade completes.

- To back up and restore your database, use the `exportData` and `importData` `cmtool` commands as described in the *ElectricAccelerator cmtool Reference Guide* at [http://docs.electric-cloud.com/accelerator\\_doc/AcceleratorIndex.html](http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html).



- Electric Cloud no longer bundles MySQL as the default local database for ElectricAccelerator. Starting with ElectricAccelerator v7.1, Electric Cloud bundles MariaDB and installs it as the default local database on the Cluster Manager. When you perform a Cluster Manager upgrade, 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. As open-source software, there is no enterprise license support model available with MariaDB. If using an open-source database is of concern to your organization, you continue to have the option to use any of the following databases as a replacement: MySQL, Oracle, or SQL Server. See the online help topic “Database Configuration” for information about configuring Accelerator to use an external database.

To upgrade the Cluster Manager:

1. Log in as Administrator.
2. Ensure that no builds are running.
3. Copy the installer executable to the Cluster Manager machine to a location such as `c:\temp`.  
Do *not* run the installer from a directory path that contains spaces (such as the Windows desktop).
4. Double-click the `ElectricAccelerator-<version>` file.  
The **Welcome** screen appears after the installation packages are extracted.
5. Proceed with the upgrade in the same way that you initially installed the Cluster Manager.  
Ensure that you type in the correct value for your Cluster Manager `admin` password. The encrypted default password is `changeme`.  
The upgrade fails if the correct password is not used. You can change the Cluster Manager `admin` password during the upgrade *only* if the current password is the default password.
6. Accept the existing Cluster Manager configuration or update your configuration settings.
7. When the **Start Copying Files** screen appears, click **Next**.  
The **Installing** screen appears. When installation is finished, the **Complete** screen appears.
8. Click **Finish**.
9. If you changed Cluster Manager ports during the upgrade, close your browser windows to avoid potential conflicts and to ensure that your settings take effect.

Installation is complete. The installation log file is in the installation directory's root by default.

**Note:** If Apache fails to start properly after the Cluster Manager installs, reboot the system.

## Upgrading the Electric Agent/EFS

### Notes:

- The Cluster Manager server and agent hosts must run the same version of Accelerator.
- After agents on the grid are upgraded, they do not re-register with the Cluster Manager until a build runs. This means that the Cluster Manager has old information about the agents and EFS (including outdated version information) until the next build runs and “wakes up” the agents. Initially, after an upgrade, the installation log might show the upgrade failed, but only until the next build is run.

### Upgrading the Electric Agent/EFS on Multiple Hosts Simultaneously

If you run `ecclusterupgrade` on a Windows 7 Cluster Manager under a user account other than the administrator account, you might encounter a `permission denied` error. This is because of a Windows 7 issue. The workaround is to run `cmd` using “Run as administrator” and then run `ecclusterupgrade`.

To upgrade the Electric Agent/EFS on multiple hosts simultaneously:

1. Log in as Administrator.
2. Ensure that no builds are running.
3. Copy the installer executable to the Cluster Manager machine to a location such as `c:\temp`.  
Do *not* run the installer from a directory path that contains spaces (such as the Windows desktop).
4. On the Cluster Manager machine, `cd` to the Accelerator `bin` directory and run:

```
ecclusterupgrade.exe
```

Depending on your setup, you might need the following options as well:

- `--agentinstalldir=<path>` indicates the agents' installation location. All agents that you want to upgrade must have the same installation location. If this is not true, you must run the script multiple times using the relevant `--agentinstalldir` path names. You must also specify the `--hosts` option to limit the upgrade to machines that use the nonstandard agent installation directory.
- `--targetos=<os>` limits which operating system to upgrade. indicates which operating system to update. Available values for `<os>` are `windows`, `linux`, and `solaris`. This lets you update any operating system type from any operating system.
- `--hosts="host1 host2 ..."` specifies a list of hosts to upgrade. You can also use a pattern such as `host[1-3]`, `host[2,5]`.
- For multiple installer versions, use one of the following options:
  - `--installerversion=<version>` to select the version. You need this option only if there are multiple installer versions in the `local/<installerdir>` location.
  - `--installer=<filename>` to explicitly select an installer. Use an absolute file name for this option.

See the "[ecclusterupgrade Options](#) for all `ecclusterupgrade` options.

Following is an example of an `ecclusterupgrade` command. This command upgrades two agents:

```
ecclusterupgrade.exe --installer=c:\tmp\ElectricAccelerator-7.1.1.48690-Windows-Install.exe --hosts="agent1 agent2"
```

### **Upgrading the Electric Agent/EFS on a Single Cluster Host**

The Electric Agent/EFS upgrade process for a single host machine is similar to a new Electric Agent/EFS installation, with one *important* exception, which is detailed below.

To upgrade the Electric Agent/EFS on a single cluster host:

1. Log in as Administrator.
2. Ensure that no builds are running.
3. Copy the installer executable to the Cluster Manager machine to a location such as `c:\temp`.  
Do *not* run the installer from a directory path that contains spaces (such as the Windows desktop).
4. Double-click `ElectricAccelerator-<version>`.  
The **Welcome** screen appears after the installation packages are extracted.
5. Click **Next** to continue.

6. Select **Electric Agent**, and then click **Next**.

The **Electric Agent** screen is filled in with your previous configuration information. The maximum number of agents allowed on one 32-bit machine is 32; the maximum for one 64-bit machine is 64.

7. Click **Next** to continue to the next screen.

If you previously specified an agent to run as a specific user, the selection is filled in as you specified.

At this point, you can revert to the ElectricAccelerator default user if you need the CSRSS, svchost, or OLE support service for your builds—these services are not available to you because you previously specified a specific user. On a single host, use of these services requires each agent service to run as a different user.

To change the service user to allow access to the CSRSS, svchost, and OLE support services, select **ECloud Internal User**. This means that the ECloud user account is used to run agent services. If you do not want to use ElectricAccelerator default accounts, use `ecconfig` on each agent host to assign distinct users to each agent.

To use the `ecconfig` option *after* upgrading your agent machines, see the [Using the ecconfig Command](#) section.

8. When the **Start Copying Files** screen appears, click **Next**.

The **Installing** screen displays while the upgrade progresses. When the upgrade is finished, the **Complete** screen appears.

9. Click **Finish**.

10. Reboot the agent machine.

The installation log file is in the installation directory's root by default.

## Upgrading Electric Make

To upgrade an Electric Make installation, you simply overwrite the existing Electric Make version using the same procedure as your [initial eMake installation](#).

**Note:** If you are uninstalling Electric Make before an upgrade, if Electric Make and the Cluster Manager are installed on the same machine, uninstalling Electric Make removes the Cluster Manager.

## Using the ecconfig Command

Open a command-line window to use `ecconfig`. The following table is the output from running `ecconfig.exe -help`.

Argument	Description
<code>-cm &lt;host&gt;:&lt;port&gt;</code>	Host and port number of the Cluster Manager that the agent host should point to
<code>-numagents &lt;number&gt;</code>	Number of agents to start. If you modify the number of agents, you must restart the agents for your change to take effect. After the restart, the server database is updated, and the agents become active

Argument	Description
<code>-agentusers "&lt;username1&gt;/&lt;password1&gt; &lt;username2&gt;/&lt;password2&gt; ... &lt;usernameN&gt;/&lt;passwordN&gt;"</code>	Agent user names and passwords <b>Note:</b> You must specify the same number of username-password pairs as the number of agents. The argument must be encapsulated in quotes
<code>-agentuser "&lt;agentID&gt; &lt;username&gt;/&lt;password&gt;"</code>	User name and password for a specific agent, where <code>&lt;agentID&gt;</code> is the numerical ID of the agent to configure (between 1 and <code>&lt;numagents&gt;</code> )
<code>-lsfhost &lt;value&gt;</code>	<code>y</code> or <code>n</code> . Type <code>y</code> to specify that this machine is part of an LSF grid or <code>n</code> for no
<code>-secureconsole &lt;value&gt;</code>	<code>y</code> or <code>n</code> . Type <code>y</code> to secure the agent console port or <code>n</code> for no
<code>-tempdir &lt;path&gt;</code>	Location where agents will store temporary files. Leave blank for the system temporary directory
<code>-help</code> or <code>-?</code>	Print this message

## ecclusterupgrade Options

Option	Description
<code>--admin-password=value</code>	The Cluster Manager admin user's password. Default is 'changeme'.
<code>--agentinstalldir=path</code>	The agent side install directory. You must specify the <code>--hosts</code> option also to limit the upgrade to those machines that use the "non-standard" agent install directory.
<code>--batchsize=int</code>	The number of hosts to process per iteration. This allows you to break the upgrade of a large cluster into more manageable smaller batches to avoid timeouts. Default is 20, the recommended maximum.
<code>--cm=host[:port[:securePort]]</code>	Cluster Manager whose hosts are to be upgraded. Default is localhost:8030:8031.
<code>--cm-secure-port=port</code>	Cluster Manager secure port. Default is 8031.
<code>--gen-hostlist</code>	Query the Cluster Manager to get the list of hosts, write it to a file, and exit.
<code>--help</code>	Display this table's help text.
<code>--hosts="host1 host2 ..."</code>	List of hosts to upgrade. Can be a pattern like <code>host[1-3]</code> , <code>host[2,5]</code> . This switch supersedes <code>--cm</code> .

Option	Description
<code>--installer=filename</code>	The installer executable to use. Use an absolute filename for this option. If the installer is not in the expected directory, you must provide the full path to the installer, even when you specify <code>--installerdir</code> .
<code>--installerdir=dirname</code>	The directory containing the installer executables.
<code>--installerversion=version</code>	The installer version (for example, 7.0.0.12345). This option is needed only if there are multiple installer versions in the <code>local/--installerdir</code> location.
<code>--installtimeout=value</code>	The number of minutes to wait for the agent install to finish. Default is 20 minutes.
<code>--logfile=value</code>	Log file to write messages to. By default, messages are printed to: <code>/var/tmp</code> (Linux and Solaris) or <code>C:\</code> (Windows) in the form of <code>ecloud_node_upgrade_YYYYMMDD_HHMMSS.log</code>
<code>--newcm=hostname/ip</code>	The host name or IP address of the new Cluster Manager where you want to migrate the upgraded agents.
<code>--remotetmpdir=path</code>	The location where the remote install is run.
<code>--targetos=os</code>	Agent machine OS (windows, linux, solaris).

## Chapter 6: Uninstalling ElectricAccelerator

The uninstaller removes all ElectricAccelerator components (including the Visual Studio Integration) as well as the installation directory and its contents from a machine at the same time. This includes the software itself, build information, and installation preferences from the prior installation. If you are uninstalling as part of an upgrade procedure, follow the instructions in [Upgrading ElectricAccelerator on Windows](#).

To uninstall the software, follow the procedures described in the following topics.

- [Uninstalling Accelerator on Linux or Solaris](#)
- [Uninstalling Accelerator on Windows](#)

## Uninstalling Accelerator on Linux or Solaris

1. Log in as root.
2. Change to the `tmp` directory by entering

```
cd /tmp
```
3. Copy the uninstaller to the `/tmp` directory by entering

```
cp /opt/eccloud/uninstall-accelerator /tmp
```
4. Invoke the uninstaller in console mode by entering

```
./uninstall-accelerator /mode console
```

The following message appears:

```
This will completely remove ElectricAccelerator from your system. Are you sure
you want to do this? [n/Y]
```

5. Enter `y` to confirm the uninstallation.

The following message appears:

```
A full uninstall will remove all leftover files, including other packages such a
s ElectricInsight.
```

```
Perform a full uninstall [y/N]
```

6. Enter `y` or `n`.

The following message appears:

```
Back up local database [y/N]
```

7. Enter `y` or `n`.

No second opportunity to confirm the uninstall request is displayed. The uninstall begins immediately.

An `Uninstall complete` message appears when Accelerator is removed.

8. Check the `/etc/sysconfig/ecagent.conf` directory (for Linux) or `/etc/ecagent.conf` directory (for Solaris) and remove the file `ecagent.conf` if you want to delete *all* Accelerator files.

## Uninstalling Accelerator on Windows

1. Go to the Electric Cloud installation folder and run `uninstall-accelerator.exe`.

You can also invoke the uninstaller by using the "Add or Remove Programs" or "Programs and Features" utilities in the Windows Control Panel.

2. Select any of the following before continuing with the uninstall process:
  - Perform a full uninstall - Removes all leftover files, including other packages such as Visual Studio Integration and ElectricInsight.
  - Back up local database - Retains a copy of your local database.

An "Uninstall Complete" message appears when Accelerator software is removed. If Electric Agent/EFS was installed, you might be prompted to reboot.

## Uninstalling ElectricAccelerator Silently

If you are uninstalling on a series of identical machines (such as a series of cluster hosts), you can use the "silent" uninstallation method, which uninstalls components automatically without user interaction.

Use the following command-line options when performing a silent uninstallation. Use this format:

```
<uninstaller filename> [options]
```

This table lists each command-line option's equivalent in the uninstaller UI and the variable that is set in the uninstaller properties file. You can use the resulting properties file for running silent uninstallations.

**Notes:**

- You can use the values “yes”, “y”, “1” and “no”, “n”, “0” interchangeably within uninstaller command-line options.
- For `--cmdbtype` and `--type`, differences exist between valid command-line option arguments and valid properties file parameters. Ensure that you provide the correct input for each method.

Command-line option	Variable set in the uninstaller properties file	Description
Equivalent uninstaller UI field		
<code>--backupdb &lt;y or n&gt;</code>	<code>EC_CM_BACKUPDB=y or n</code>	Specifies whether to back up the database. Remote databases are not backed up. Default: n
<code>--debug</code>	n/a	Runs the uninstaller in debug mode.
<code>--debugconsole</code>	n/a	Runs the uninstaller with the debug console open.
<code>--fulluninstall &lt;y or n&gt;</code>	<code>EC_FULL_UNINSTALL=y or n</code>	Specifies whether to perform a complete uninstallation. A complete uninstallation deletes the top-level installation directory.
<code>--logfile [ARG]</code>	<code>EC_LOGFILE=???</code>	Specifies the log file to use for debug logging
<code>--mode &lt;console, silent, or standard&gt;</code>	n/a	Sets the mode in which to run the uninstaller. For a console login, standard mode and console mode are identical. For a GUI machine, <code>standard</code> brings up the UI. On Linux or Solaris, if you are running the X Window System, you must use <code>console</code> if you want to invoke console mode. For silent uninstallation, use <code>silent</code> .
<code>--test</code>	n/a	Runs the uninstaller without uninstalling any files.
<code>--upgrade &lt;y or n&gt;</code>	<code>EC_IS_UPGRADE=y or n</code>	Performs an upgrade uninstallation (only partial).



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