ElectricAccelerator Version 9.0

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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.
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. The ElectricAccelerator Electric Make User Guide contains information about using Electrify.

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

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

- Debian Linux Platforms
- Red Hat Enterprise Linux Platforms
- SUSE Linux Enterprise Server Platforms
- Ubuntu Platforms

For the latest updates to this information, see the ElectricAccelerator 9.0 Release Notes at http://docs.electric-cloud.com/accelerator_doc/AcceleratorIndex.html

Debian Linux Platforms

<table>
<thead>
<tr>
<th>Platform</th>
<th>Notes</th>
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</table>
| Debian 8 (kernel 3.16) (64-bit) | - 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.)
  - SELinux must be disabled. To disable SELinux, modify /etc/selinux/config by changing SELINUX=enforcing to SELINUX=disabled. |
| Debian 7 (kernel 3.2) (64-bit)  | - 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.)
  - SELinux must be disabled. To disable SELinux, modify /etc/selinux/config by changing SELINUX=enforcing to SELINUX=disabled. |
## Red Hat Enterprise Linux Platforms

<table>
<thead>
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<th>Platform</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>RHEL 7.3 (kernel 3.10.0-514) (64-bit)</td>
<td>• 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-</code>uname -r` command.</td>
</tr>
<tr>
<td>RHEL 7.2 (kernel 3.10.0-327) (64-bit)</td>
<td>• You must install 32-bit libraries before invoking the installer. The <code>libstdc++.i686</code> library must be installed.</td>
</tr>
<tr>
<td>RHEL 7.1 (kernel 3.10.0-229) (64-bit)</td>
<td>• 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-softokn-freebl-3.12.4-11.el6.i686</code>.</td>
</tr>
<tr>
<td>RHEL 7.0 (kernel 3.10.0-123) (64-bit)</td>
<td>• Be advised of a known Linux kernel issue.</td>
</tr>
<tr>
<td></td>
<td>• SELinux must be disabled. To disable SELinux, modify <code>/etc/selinux/config</code> by changing SELINUX=enforcing to SELINUXX=disabled.</td>
</tr>
<tr>
<td></td>
<td>• Extended attributes (xattr) are not supported. Attempting to query or set extended attributes for a file returns an ENOTSUPP (&quot;Operation not supported&quot;) error.</td>
</tr>
<tr>
<td></td>
<td>• Only x86-64 is supported. IA-64 (Itanium) is not supported.</td>
</tr>
<tr>
<td></td>
<td>• The XFS and ext4 file systems are supported.</td>
</tr>
<tr>
<td>Platform</td>
<td>Notes</td>
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</tr>
</tbody>
</table>
| RHEL 6.8 (kernel 2.6.32-642) (32- and 64-bit) | • For agent hosts, you must install the correct kernel-devel package before invoking the installer. To install this package, you can enter the `yum install kernel-devel-`uname -r` command.  
• For 64-bit systems, you must install 32-bit libraries before invoking the installer. The libstdc++.i686 library must be installed.  
• Run `yum install glibc.i686`. If a yum server is not present, the required RPMs are glibc-2.11.1.1.10.el6.i686 and nss-softokn-freebl-3.12.4-11.e16.1686.  
• Be advised of a known Linux kernel issue.  
• SELinux must be disabled. To disable SELinux, modify `/etc/selinux/config` by changing SELINUX=enforcing to SELINUX=disabled.  
• Extended attributes (xattr) are not supported. Attempting to query or set extended attributes for a file returns an ENOTSUPP ("Operation not supported") error.  
• For 32-bit, only x86 is supported. For 64-bit, only x86-64 is supported. IA-64 (Itanium) is not supported. |
| 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) |                                                                                                                                                                                                     |
## Chapter 2: Supported Platforms and System Requirements

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<tr>
<th>Platform</th>
<th>Notes</th>
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</table>
| RHEL 5.11 (kernel 2.6.18-398) (32- and 64-bit) | • For agent hosts, you must install the correct `kernel-devel` package before invoking the installer. To install this package, you can enter the `yum install kernel-devel-`uname -r` command.  
  • Be advised of a known Linux kernel issue.  
  • SELinux must be disabled. To disable SELinux, modify `/etc/selinux/config` by changing `SELINUX=enforcing` to `SELINUX=disabled`.  
  • Extended attributes (xattr) are not supported. Attempting to query or set extended attributes for a file returns an ENOTSUPP ("Operation not supported") error.  
  • For 32-bit, only x86 is supported. For 64-bit, only x86-64 is supported. IA-64 (Itanium) is not supported. |
| 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)                                                   |
| RHEL 4.9 (kernel 2.6.9-100) |                                                                 |
| RHEL 4.8 (kernel 2.6.9-89)   |                                                                 |
|                           | (32- and 64-bit)                                                   |
**SUSE Linux Enterprise Server Platforms**

<table>
<thead>
<tr>
<th>Platform</th>
<th>Notes</th>
</tr>
</thead>
</table>
| SLES 12 (kernel 3.12.28) (64-bit) | • For agent hosts, you must install the gcc and kernel-source packages before invoking the installer.  
  • To install gcc, run `sudo zypper install gcc`  
  This installs the following: gcc, gcc43, glibc-devel, linux-kernel-headers.  
  • To install kernel-source, run `sudo zypper install kernel-source`  
  • SELinux must be disabled. To disable SELinux, modify `/etc/selinux/config` by changing SELINUX=enforcing to SELINUX=disabled.  
  • Extended attributes (xattr) are not supported. Attempting to query or set extended attributes for a file returns an ENOTSUPP ("Operation not supported") error.  
  • 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 Platforms**

<table>
<thead>
<tr>
<th>Platform</th>
<th>Notes</th>
</tr>
</thead>
</table>
| Ubuntu Linux 16.04 (kernel 4.4.0-18) (64-bit) | • 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 ia32-libs (to do so, use the `sudo apt-get install ia32-libs command`). On newer Ubuntu versions such as 14.04, install the ia32-libs-multarch libraries.  
  • SELinux must be disabled. To disable SELinux, modify `/etc/selinux/config` by changing SELINUX=enforcing to SELINUX=disabled.  
  • Extended attributes (xattr) are not supported. Attempting to query or set extended attributes for a file returns an ENOTSUPP ("Operation not supported") error.  
  • 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.

<table>
<thead>
<tr>
<th>Platform</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows 10 (64-bit only)</td>
<td>• NTFS is required.</td>
</tr>
<tr>
<td></td>
<td>• For 64-bit, only x64-64 is supported. IA-64 (Itanium) is not supported.</td>
</tr>
<tr>
<td></td>
<td>• To run eMake with Visual Studio on Windows, one of the following is required:</td>
</tr>
<tr>
<td></td>
<td>• Visual Studio 2005 SP1</td>
</tr>
<tr>
<td></td>
<td>• Visual Studio 2005 SP1 Redistributable Package. A link is provided for your convenience:</td>
</tr>
<tr>
<td></td>
<td>64-bit</td>
</tr>
<tr>
<td>Windows 8 (64-bit)</td>
<td>• NTFS is required.</td>
</tr>
<tr>
<td></td>
<td>• Only x64-64 is supported. IA-64 (Itanium) is not supported.</td>
</tr>
<tr>
<td></td>
<td>• To run eMake with Visual Studio on Windows, one of the following is required:</td>
</tr>
<tr>
<td></td>
<td>• Visual Studio 2005 SP1</td>
</tr>
<tr>
<td></td>
<td>• Visual Studio 2005 SP1 Redistributable Package. A link is provided for your convenience:</td>
</tr>
<tr>
<td></td>
<td>64-bit</td>
</tr>
<tr>
<td>Platform</td>
<td>Notes</td>
</tr>
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</tr>
</tbody>
</table>
| Windows 7 (32 or 64-bit) | - 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:  
  - 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) | - 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:  
  - Visual Studio 2005 SP1  
  - Visual Studio 2005 SP1 Redistributable Package. A link is provided for your convenience:  
    - 64-bit |
| Windows Server 2008 R2 (64-bit only) | - 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:  
  - 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:
Chapter 2: Supported Platforms and System Requirements

<table>
<thead>
<tr>
<th>Platform</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solaris 10 (SPARC and x86)</td>
<td>• Agent and eMake only, no Cluster Manager support starting with Accelerator v7.1</td>
</tr>
<tr>
<td></td>
<td>• Application is 32-bit only for Cluster Manager and eMake, and 64-bit only for agents.</td>
</tr>
<tr>
<td></td>
<td>• 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:</td>
</tr>
<tr>
<td></td>
<td>ld.so.1: emake: fatal: libxml2.so.2: version 'LIBXML2_2.7.6' not found (required by file /opt/ecloud/i686_SunOS.5.10/bin/emake)</td>
</tr>
<tr>
<td></td>
<td>ld.so.1: emake: fatal: libxml2.so.2: open failed: No such file or directory</td>
</tr>
<tr>
<td></td>
<td>then it is likely that your LD_LIBRARY_PATH environment 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.</td>
</tr>
</tbody>
</table>

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)

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 “ElectricAccelerator Ledger File” in the ElectricAccelerator Electric Make User Guide.)

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

RHEL 4.6


**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 00:53:03 2013) built at $Date: 2013-05-16.22:01:13 (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. If you have need of this support, please contact your Electric Cloud sales representative. You can use ecclearcase_fake.so to provide information about your ClearCase setup through an ini file. See the "eMake's "fake" interface for ClearCase" section in the ElectricAccelerator Electric Make User Guide.

### 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 and Disk Space Requirements

<table>
<thead>
<tr>
<th></th>
<th>Memory</th>
<th>Free Disk Space</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommended</strong></td>
<td>2 GB per agent plus the amount of RAM normally needed to execute your build. For example, if you are running four agents and your build normally needs 16 GB, you will need ((2 \times 4) + 16) = 24 GB.</td>
<td>At least 3-4 times the size of a complete build (input and output).</td>
</tr>
<tr>
<td><strong>Minimum</strong></td>
<td>1 GB per agent (machine minimum of 2 GB)</td>
<td></td>
</tr>
</tbody>
</table>

**Electric Make Machine**

<table>
<thead>
<tr>
<th></th>
<th>Memory</th>
<th>Disk Space</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum</strong></td>
<td>2 GB</td>
<td>Free disk space should be at least 200 MB or equal to the size of your largest build.</td>
</tr>
</tbody>
</table>

**Cluster Manager Machine**

<table>
<thead>
<tr>
<th></th>
<th>Memory</th>
<th>Disk Space</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum</strong></td>
<td>2 GB</td>
<td>5 GB (to allow space for build log storage)</td>
</tr>
</tbody>
</table>

**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
- Safari 7 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, it must be installed on each agent. Software such as Norton Ghost might help mirror all agent hosts. For more information, see the "Configuring Tools" section in Chapter 3 of the ElectricAccelerator Electric Make User Guide or (for Visual Studio users) the Visual Studio Integration Guide.

**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 libation
```

**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:

<table>
<thead>
<tr>
<th>Bitness</th>
<th>Cygwin Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>32-bit emake with 32-bit</td>
<td>Cygwin 2.3.0, 2.04, 1.7.9, 1.5.25</td>
</tr>
<tr>
<td>64-bit emake with 64-bit</td>
<td>Cygwin 2.3.0, 2.0.4</td>
</tr>
</tbody>
</table>

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:
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 7.0 installed and was upgraded to 8.0, the 7.0 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 7.0 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 7.0 Electric Make version with an 8.0 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 8.0 agents with a 7.0 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 snntp to synchronize clocks. For more information, see [http://www.ntp.org/](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"](http://www.microsoft.com/technet) 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. See the ElectricAccelerator Electric Make User Guide, Electric Make Command-Line Options and Environment Variables section for information on the `emake --emake-resource` option.

- 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 particular 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 Information

- 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

Installing any component completely replaces the current installation on that machine. Only one ElectricAccelerator installation can exist on a machine and it is whatever combination of components were chosen from the most recent install. For example, installing the Cluster Manager on a machine with the Electric Agent, results in a machine with Cluster Manager only, not a machine with the Electric Agent and Cluster Manager.

- Additional Linux Installation Information
- Installing the Cluster Manager
- Installing Agent/EFS
- Installing Hybrid 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.

**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 v7.1, Accelerator does not support installing the Cluster Manager on Solaris.

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 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 Install the Cluster Manager**

1. Log in as root.
   
   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.
   2 - Electric Make
       Installs Electric Make.
   3 - Cluster Manager
       Installs Cluster Manager and Electric Make.
4 - Electric Runner Client
   Installs Electric Runner Client component to run commands on the
   cluster.
5 - Electric Runner Server
   Installs Electric Runner Server to execute cluster commands on the
   local machine.
6 - ElectricAccelerator Hybrid Agent
   Installs ElectricAccelerator Hybrid Agent.

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 enter 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.
Chapter 3: Installing ElectricAccelerator

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, you must answer “yes” (y) to any prompt that asks whether or not 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.

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.

   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: Avoid selecting 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 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 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 do not plan to 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, the term “LSF” refers to all grid engines.)
- Accept the default to keep all existing log files or select the checkbox to Remove existing log files.
- Select the checkbox to Reboot host if needed.
- Accept the default to install the Electric Runner service, or clear the checkbox to not install this service.

**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 ECcloud Internal User or select Existing User. If you select Existing User, click **Add User** to add a user account. Click
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   ○ 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.
   2 - Electric Make
      Installs Electric Make.
   3 - Cluster Manager
      Installs Cluster Manager and Electric Make.
   4 - Electric Runner Client
      Installs Electric Runner Client component to run commands on the cluster.
   5 - Electric Runner Server
      Installs Electric Runner Server to execute cluster commands on the local machine.
   6 - ElectricAccelerator Hybrid Agent
      Installs ElectricAccelerator Hybrid Agent.

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 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 you 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/ecloud by default.

**Installing Hybrid Electric Agent/EFS**

A hybrid agent is a local agent with an eMake client license that allows hybrid usage. This means that eMake can use both local agents and cluster agents.

A hybrid agent is not configured to connect to a Cluster Manager. Instead, it is accessible only to eMake processes running on the same host. An eMake client license file that allows a hybrid agent has the ClusterAccess field set to 1. Every hybrid agent requires its own license.

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

**Using the GUI to Install Hybrid Agents**

1. Log in as root.

   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 ElectricAccelerator Hybrid Agent, and click Next.
5. On the Choose Destination Location screen, accept the default installation directory or browse to select an alternative directory.
Note: Avoid selecting an alternative directory that includes spaces in its name. Spaces can create problems when configuring connections with other command-line-based components.

Then click Next.

6. On the Base Setup screen, choose whether you want to install Electric Runner client applications, and click Next.

7. On the Electric Agent screen, enter options for the locally-installed Electric Agent/EFS.
   - Enter localhost for the Cluster Manager host name or IP address.
   - Accept the default Cluster Manager port 8030 or type the alternative port specified during the Cluster Manager server installation.
   - 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 to use it.
   - Accept the default to keep all existing log files, or select the checkbox to Remove existing log files.
   - Select the checkbox to Reboot host if needed.

   Click Next.

8. (Windows only) Select the user accounts that will 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.

   - 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**.
   When installation is finished, the Complete screen appears.

12. Click **Finish**.
   The installation log file is in the installation directory’s root by default.

13. Copy the eMake client license file to `<install_dir>/i686_Linux/licenses/emake.lic`. The default directory is `/opt/ecloud/i686_Linux/licenses/` on Linux and `C:\ECloud\i686_win32\licenses\` on Windows. You might need to create the `licenses` directory.

**Using the Interactive Command Line to Install Hybrid 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.
   2 - Electric Make
       Installs Electric Make.
   3 - Cluster Manager
       Installs Cluster Manager and Electric Make.
   4 - Electric Runner Client
       Installs Electric Runner Client component to run commands on the cluster.
   5 - Electric Runner Server
       Installs Electric Runner Server to execute cluster commands on the local machine.
   6 - ElectricAccelerator Hybrid Agent
       Installs ElectricAccelerator Hybrid Agent.
   ```

5. Enter 6 to select the **ElectricAccelerator Hybrid Agent** 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 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 you selection and press Enter to continue.

The installer displays:
Host is part of Platform Computing LSF Grid [y/N]


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:
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/ecloud by default.

Installing Electric Make

Electric Make can be installed on a networked machine or on a shared file server accessible to other build machines. Wherever Electric Make 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 Electric Make is installed, configure Electric Make for your build environment and enable communication with Cluster Manager. For information on enabling communication with Cluster Manager, see “Configuring ElectricAccelerator” in the ElectricAccelerator Electric Make User Guide.

Using the GUI to Install Electric Make

1. Log in as root.
2. Double-click the ElectricAccelerator-<version>-<platform>-installer file to start installation.
   
   **Note:** It might take a few minutes to extract the installation packages to your machine before you see the installation wizard.

3. When the Welcome screen appears, click Next to continue to the Setup Type screen.
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:** Avoid selecting 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 you selection and click Next.

7. If the machine already has Electric Make installed and you chose to install this version of Electric Make 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. 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 Electric Make

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.
   2 - Electric Make
       Installs Electric Make.
   3 - Cluster Manager
       Installs Cluster Manager and Electric Make.
   4 - Electric Runner Client
       Installs Electric Runner Client component to run commands on the cluster.
   5 - Electric Runner Server
       Installs Electric Runner Server to execute cluster commands on the local machine.
6 - ElectricAccelerator Hybrid Agent
   Installs ElectricAccelerator Hybrid Agent.
5. Enter 2 to select the Electric Make 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 you install Electric Make in a non-default location, ensure 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 you selection and press Enter to continue.

   If the machine already has Electric Make installed and you chose to install this version of Electric Make 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 Electric Make 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

Installing any component completely replaces the current installation on that machine. Only one ElectricAccelerator installation can exist on a machine and it is whatever combination of components were chosen from the most recent install. For example, installing the Cluster Manager on a machine with the Electric Agent, results in a machine with Cluster Manager only, not a machine with the Electric Agent and Cluster Manager.
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.

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 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.

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.

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, you must answer “yes” (y) to any prompt that asks whether or not 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:\MyCloud in an exclusion list or disable the AutoProtect feature. Electric Cloud generally considers agent machines safe because they are internal machines residing behind a firewall. If you need more information, contact Electric Cloud technical support.

### 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:** Avoid selecting 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 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 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 do not plan to 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, the term “LSF” refers to all grid engines.)
   - Accept the default to keep all existing log files or select the checkbox to Remove existing log files.
   - Select the checkbox to Reboot host if needed.
   - Accept the default to install the Electric Runner service, or clear the checkbox to not install this service.
**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. Click **Next**.

   - 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\eclouduninst.exe
- C:\ecinst\fsize.exe
• C:\ecinst\Setup.exe
• C:\ecinst\SetupErunnerTmp.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 Hybrid Electric Agent/EFS

A hybrid agent is a local agent with an eMake client license that allows hybrid usage. This means that eMake can use both local agents and cluster agents.

A hybrid agent is not configured to connect to a Cluster Manager. Instead, it is accessible only to eMake processes running on the same host. An eMake client license file that allows a hybrid agent has the ClusterAccess field set to 1. Every hybrid agent requires its own license.

**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 residing behind a firewall. If you need more information, contact Electric Cloud technical support.

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 ElectricAccelerator Hybrid Agent, and click Next.
5. On the Choose Destination Location screen, accept the default installation directory or browse to select an alternative directory.
Chapter 3: Installing ElectricAccelerator

**Note:** Avoid selecting an alternative directory that includes spaces in its name. Spaces can create problems when configuring connections with other command-line-based components.

Then click **Next**.

6. On the Base Setup screen, choose whether you want to install Electric Runner client applications, and click **Next**.

7. On the Electric Agent screen, enter options for the locally-installed Electric Agent/EFS.
   - Enter `localhost` for the Cluster Manager host name or IP address.
   - Accept the default Cluster Manager port 8030 or type the alternative port specified during the Cluster Manager server installation.
   - 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 to use it.
   - Accept the default to keep all existing log files, or select the checkbox to Remove existing log files.
   - Select the checkbox to Reboot host if needed.

![ElectricAccelerator Setup](image)

Click **Next**.

8. (Windows only) Select the user accounts that will 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**.

   - 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**.
   When installation is finished, the Complete screen appears.

12. Click **Finish**.
   The installation log file is in the installation directory’s root by default.

13. Copy the eMake client license file to `<install_dir>/e686/Linux/licenses/emake.lic`. The default directory is 
   `/opt/ecloud/e686/Linux/licenses/` on Linux and `C:\ECloud\e686_win32\licenses\` on Windows. You might need to create the `.licenses` directory.

### 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\eclouduninst.exe`
- `C:\ecinst\fsize.exe`
- `C:\ecinst\Setup.exe`
- `C:\ecinst\SetupErunnerTmp.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

Electric Make can be installed on a networked machine or on a shared file server accessible to other build machines. Wherever Electric Make 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 Electric Make is installed, configure Electric Make for your build environment and enable communication with Cluster Manager. For information on enabling communication with Cluster Manager, see “Configuring ElectricAccelerator” in the ElectricAccelerator Electric Make User Guide.

### 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 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:** Avoid selecting 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 you selection and click **Next**.

7. If the machine already has Electric Make installed and you chose to install this version of Electric Make 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. 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.

<table>
<thead>
<tr>
<th>Command-line option</th>
<th>Variable set in the installer properties file</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allow multiple Emake installations in separate directories</td>
<td>EC_EMAKE_ALLOW_MULTIPLE_EMAKES= y or n</td>
<td>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. This option is available only if you choose a different installation directory from the current eMake installation.</td>
</tr>
<tr>
<td><code>--adminuserpassword</code> [ARG]</td>
<td>EC_CM_ADMINUSER_PASSWORD=</td>
<td>Sets the Cluster Manager Administrator user password.</td>
</tr>
<tr>
<td>Cluster Manager Administrator Password</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>--agentallowreboot &lt;y or n&gt;</code></td>
<td>EC_AGENT_REBOOT=y or n</td>
<td>Indicates if you want to reboot after installing Electric Agent/EFS. Default: n. 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. For UNIX, the machine does not reboot unless required, even if you specify EC_AGENT_REBOOT=y.</td>
</tr>
<tr>
<td>Reboot the host if needed</td>
<td></td>
<td></td>
</tr>
<tr>
<td><code>--agentcmhost</code> [ARG]</td>
<td>EC_AGENT_CMHOST=&lt;hostname or IP address&gt;</td>
<td>Sets the Cluster Manager hostname or IP address for this host to connect to. Example: 192.205.2.19 or winlong-cm. Not required if using a grid.</td>
</tr>
<tr>
<td>Command-line option</td>
<td>Variable set in the installer properties file</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>--agentcmport [ARG]</td>
<td>EC_AGENT_CMPORT=8030 (default)</td>
<td>Sets the Cluster Manager server port number for this host to connect to. Not required if using a grid.</td>
</tr>
<tr>
<td>--agentinstallerunnerd &lt;y or n&gt;</td>
<td>EC_AGENT_INSTALLERUNNERD=y or n</td>
<td>y installs eRunnerd on agent machines. Default: y</td>
</tr>
<tr>
<td>--agentislsfhost &lt;y or n&gt;</td>
<td>EC_AGENT_IS_LSF_HOST=y or n</td>
<td>Indicates if the agent host is on the grid. For this option/parameter, the term &quot;LSF&quot; refers to all grid engines. Default: n</td>
</tr>
<tr>
<td>--agentnumber [ARG]</td>
<td>EC_AGENT_AGENT_NUMBER=1 to 32</td>
<td>Sets the number of agents to set up on the host. The maximum is 32 for 32-bit and 64 for 64-bit machines.</td>
</tr>
<tr>
<td>--agentpassword [ARG]</td>
<td>EC_AGENT_WINUSER_PASSWORD=</td>
<td>Sets the password for ECloudInternalUser (Windows only).</td>
</tr>
<tr>
<td>--agentremovelogs &lt;y or n&gt;</td>
<td>EC_AGENT_REMOVE_LOGS=y or n</td>
<td>Removes old agent log files. If not, the install appends to them. Default: n</td>
</tr>
<tr>
<td>--agentsecureconsole &lt;y or n&gt;</td>
<td>EC_AGENT_SECURE_CONSOLE_PORT= y or n</td>
<td>y requires an agent-generated key to be entered before commands will run on the agent console port. Default: n</td>
</tr>
<tr>
<td>--agentskipefs &lt;1 or 0&gt;</td>
<td>n/a</td>
<td>Prevents (y) the installer from installing EFS. Default: 0 (n)</td>
</tr>
<tr>
<td>--agentskiplofs &lt;1 or 0&gt;</td>
<td>n/a</td>
<td>Prevents (y) the installer from installing LOFS. Default: 0 (n)</td>
</tr>
<tr>
<td>Command-line option</td>
<td>Equivalent installer UI field</td>
<td>Variable set in the installer properties file</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>--agenttempdir [ARG]</td>
<td>Agent temporary directory</td>
<td>EC_AGENT_TEMPDIR=&lt;dir&gt;</td>
</tr>
<tr>
<td>--agentuserlist [ARG]</td>
<td>Existing User</td>
<td>n/a</td>
</tr>
<tr>
<td>--backupdb &lt;y or n&gt;</td>
<td>Back up local database</td>
<td>EC_CM_BACKUPDB=y or n</td>
</tr>
<tr>
<td>--baseinstallerunner &lt;y or n&gt;</td>
<td>Install Electric Runner client apps</td>
<td>EC_BASE_INSTALL_ERUNNER=y or n</td>
</tr>
<tr>
<td>--cmaccelport [ARG]</td>
<td>Cluster Manager Accelerator Server port</td>
<td>EC_CM_ACCELPORT=8030 (default)</td>
</tr>
<tr>
<td>--cmaccelsport [ARG]</td>
<td>Cluster Manager Secure Accelerator Server port</td>
<td>EC_CM_ACCELSPORT=8031 (default)</td>
</tr>
<tr>
<td>--cmdbhost [ARG]</td>
<td>Database Host/IP address</td>
<td>EC_CM_DBHOST=localhost (default)</td>
</tr>
<tr>
<td>--cmdbname [ARG]</td>
<td>Database Name</td>
<td>EC_CM_DBNAME=ecloud (default)</td>
</tr>
<tr>
<td>--cmdbpassword [ARG]</td>
<td>Database Password</td>
<td>EC_CM_DBPASSWORD=ecloud (default)</td>
</tr>
<tr>
<td>Command-line option</td>
<td>Equivalent installer UI field</td>
<td>Variable set in the installer properties file</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------------------------------------------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>--cmdbport [ARG]</td>
<td>Database Port</td>
<td>EC_CM_DBPORT=3306 (default)</td>
</tr>
<tr>
<td>--cmdbtype &lt;mariadb, mysql, oracle, or mssql&gt;</td>
<td>Database Type</td>
<td>EC_CM_DBTYPE=MariaDB (default), MySQL, Oracle, or MSSQL</td>
</tr>
<tr>
<td>--cmdbuser [ARG]</td>
<td>Database User</td>
<td>EC_CM_DBUSER=root (default)</td>
</tr>
<tr>
<td>--cmhttpport [ARG]</td>
<td>Cluster Manager HTTP port</td>
<td>EC_CM_HTTPPORT=80 (default)</td>
</tr>
<tr>
<td>--cmhttpsport [ARG]</td>
<td>Cluster Manager HTTPS port</td>
<td>EC_CM_HTTPSPORT=443 (default)</td>
</tr>
<tr>
<td>--cmlogrotate &lt;y or n&gt;</td>
<td>Rotate Cluster Manager logs</td>
<td>EC_CM_LOGROTATE=y or n</td>
</tr>
<tr>
<td>--cmmigratedb &lt;y or n&gt;</td>
<td>Migrate existing database</td>
<td>EC_CM_MIGRATEDB=y or n</td>
</tr>
<tr>
<td>--cmremovelogs &lt;y or n&gt;</td>
<td>Remove old Cluster Manager logs</td>
<td>EC_CM_REMOVE_LOGS=y or n</td>
</tr>
<tr>
<td>--cmservername [ARG]</td>
<td>n/a</td>
<td>EC_CM_SERVERNAME=</td>
</tr>
<tr>
<td>--cmserviceuser</td>
<td>Cluster Manager Service User</td>
<td>EC_CM_SERVICEUSER=&lt;existing LDAP user or local user&gt;</td>
</tr>
<tr>
<td>Command-line option</td>
<td>Equivalent installer UI field</td>
<td>Variable set in the installer properties file</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------------------------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>--cmSystemServicePassword</td>
<td>Cluster Manager Service User Password</td>
<td>EC_CM_SERVICEUSER_PASSWORD=</td>
</tr>
<tr>
<td>--debug</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>--debugconsole</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>--erunnerdport</td>
<td>Electric Runner Server Port</td>
<td>EC_ERUNNERD_PORT=2411 (default)</td>
</tr>
<tr>
<td>--erunnerdremovelogs &lt;y or n&gt;</td>
<td>Remove old Electric Runner logs</td>
<td>EC_ERUNNERD_REMOVE_LOGS=y or n</td>
</tr>
<tr>
<td>--finalprefix [ARG]</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>--ignoreoldconf &lt;y or n&gt;</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>--mode &lt;console, silent, or standard&gt;</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Command-line option</td>
<td>Variable set in the installer properties file</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>--noredist &lt;y or n&gt;</td>
<td>EC_BASE_NOREDIST=y or n</td>
<td>Does not install the Microsoft Visual C++ 2005 SP1 Redistributable (Windows only). Default: n</td>
</tr>
<tr>
<td></td>
<td>Do not install the redistributables</td>
<td></td>
</tr>
<tr>
<td>--pdfreader [ARG]</td>
<td>UnixPDFReader=&lt;path to PDF reader&gt;</td>
<td>Sets the PDF reader to use.</td>
</tr>
<tr>
<td>&lt;browse to location&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--prefix [ARG]</td>
<td>InstallDir=&lt;dir&gt;</td>
<td>Sets the installation directory. Windows default: C:\ECLOUD UNIX default: /opt/ecloud</td>
</tr>
<tr>
<td>Destination Folder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--propertyfile [ARG]</td>
<td>n/a</td>
<td>Sets the property file from which to read installer options.</td>
</tr>
<tr>
<td>n/a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--removezips &lt;1 or 0&gt;</td>
<td>n/a</td>
<td>Removes (1) zip files after installation.</td>
</tr>
<tr>
<td>n/a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--rootrun &lt;1 or 0&gt;</td>
<td>n/a</td>
<td>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).</td>
</tr>
<tr>
<td>n/a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--rwprefix [ARG]</td>
<td>n/a</td>
<td>Specifies the location for read/write files.</td>
</tr>
<tr>
<td>n/a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--skiprun &lt;1 or 0&gt;</td>
<td>n/a</td>
<td>Prevents (1) the installer from starting the agent or Cluster Manager</td>
</tr>
<tr>
<td>n/a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--temp [ARG]</td>
<td>n/a</td>
<td>Sets the temporary directory used by this program.</td>
</tr>
<tr>
<td>n/a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Command-line option</td>
<td>Variable set in the installer properties file</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>--test</td>
<td>n/a</td>
<td>Runs the installer without installing any files.</td>
</tr>
<tr>
<td>n/a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--type &lt;agent, emake, cm, erunner, erunnerd, localagent, or upgrade&gt;</td>
<td>InstallType=Electric Agent, Electric Make, Cluster Manager, Electric Runner Client, Electric Runner Server, Custom, or Local Agent</td>
<td>Type of installation to perform.</td>
</tr>
<tr>
<td>&lt;select install type&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--version</td>
<td>n/a</td>
<td>Displays installer version information.</td>
</tr>
<tr>
<td>n/a</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 3-28 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:

   ```bash
   # ./<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:

   ```cmd
   <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/ 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/ecloud/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.

2. Copy the\cjdbc6.jar file to <ECloud\install1>/<arch>/lib/.
   - On Linux, the default location is /opt/ecloud/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/ecloud).
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).

**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](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](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>\Profiles]
"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):

```bash
  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):

```bash
  [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.

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](http://msdn.microsoft.com/en-us/library/ms724475.aspx)). Configuration data is stored under the program IDs, CLSID, Interface, TypeLib, AppId, 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:


```plaintext
\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:


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:

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


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:

```plaintext
\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/ecloud/i686_Linux/conf`
- **Windows:** `C:\ECloud\i686_win32\conf`
- **Solaris SPARC:** `/opt/ecloud/sun4u_SunOS/conf`
- **Solaris x86:** `/opt/ecloud/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”.

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.
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

```xml
<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:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>emailAttribute</td>
<td>(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.</td>
</tr>
<tr>
<td>fullUserNameAttribute</td>
<td>(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.</td>
</tr>
<tr>
<td>Property</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>managerDn</td>
<td>(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. <strong>Note:</strong> This user does not need to be an admin user with modify privileges.</td>
</tr>
<tr>
<td>managerPassword</td>
<td>(optional) If the managerDn property is set, this password is used to authenticate the manager user.</td>
</tr>
<tr>
<td>providerName</td>
<td>This human readable name is displayed in the user interface to identify users and groups that come from this provider.</td>
</tr>
<tr>
<td>userBase</td>
<td>This string is prepended to the <code>basedn</code> to construct the directory DN that contains user records.</td>
</tr>
<tr>
<td>userNameAttribute</td>
<td>The attribute in a user record that contains the user’s account name.</td>
</tr>
<tr>
<td>userSearchFilter</td>
<td>This LDAP query is performed in the context of the user directory to search for a user by account name. The string <code>{0}</code> is replaced with the user’s login ID. Typically, the query compares a user record attribute with the substituted user login ID.</td>
</tr>
<tr>
<td>userSearchSubtree</td>
<td>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.</td>
</tr>
<tr>
<td>url</td>
<td>The LDAP server URL is in the form <code>protocol://host:port/basedn</code>. Protocol is either ldap or ldaps (for secure LDAP). The port is implied by the protocol, but can be overridden if it is not at the default location (389 for ldap, 636 for ldaps). 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. <strong>Note:</strong> Spaces in the <code>basedn</code> must be URL encoded (%20).</td>
</tr>
<tr>
<td>verifyCerts</td>
<td>(optional) This property enables certificate verification for LDAPS connections if true.</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>groupBase</td>
<td>(optional) This string is prepended to the <code>basedn</code> to construct the directory DN that contains group records.</td>
</tr>
<tr>
<td>groupMemberAttributes</td>
<td>(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.</td>
</tr>
<tr>
<td>Property</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>groupMemberFilter</td>
<td>(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 groupOfNames or uniqueGroupOfNames records where members are identified by the full user DN. Both forms are supported, so the query is passed two parameters: &quot;(0)&quot; is replaced with the full user record DN, and &quot;(1)&quot; is replaced with the user's account name.</td>
</tr>
<tr>
<td>groupNameAttribute</td>
<td>(optional) The group record attribute that contains the name of the group.</td>
</tr>
<tr>
<td>groupSearchFilter</td>
<td>(optional) This LDAP query is performed in the context of the groups directory to enumerate group records.</td>
</tr>
</tbody>
</table>

**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**

```bash
# 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
```
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.idap.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"/>
</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:
Chapter 4: Configuring ElectricAccelerator

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCELERATOR_MAIL_HOST</td>
<td>The name of the SMTP mail server.</td>
</tr>
<tr>
<td>ACCELERATOR_MAIL_PORT</td>
<td>The mail server port. Typically, this ‘25’ for SMTP or ‘465’ for Secure SMTP.</td>
</tr>
<tr>
<td>ACCELERATOR_MAIL_PROTOCOL</td>
<td>The mail server protocol. This can be ‘smtp’ for SMTP or ‘smtps’ for Secure SMTP.</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCELERATOR_MAIL_USERNAME</td>
<td>The user name required for authentication.</td>
</tr>
<tr>
<td>ACCELERATOR_MAIL_PASSWORD</td>
<td>The password to use for authentication.</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email Interval</td>
<td>The number of minutes between email notifications.</td>
</tr>
<tr>
<td>Email Item Limit</td>
<td>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.</td>
</tr>
<tr>
<td>Email From</td>
<td>The name you use in the ‘From’ line in the email header.</td>
</tr>
<tr>
<td>Email Prefix</td>
<td>A string prepended to every subject line of each outgoing email. This string can be used to assist with mail filtering.</td>
</tr>
</tbody>
</table>

**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:

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:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>maxfilesize &lt;bytes&gt;</td>
<td>Get or set the maximum file size for log files before they are rotated. The default is 1 GB.</td>
</tr>
<tr>
<td>filename &lt;path&gt;</td>
<td>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>).</td>
</tr>
<tr>
<td>retaincount &lt;count&gt;</td>
<td>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.</td>
</tr>
<tr>
<td>clear</td>
<td>Clear the contents of the ecagentN.log file. This is useful when log rotation is turned off.</td>
</tr>
</tbody>
</table>

### 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**

<table>
<thead>
<tr>
<th>Platform</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux</td>
<td>/opt/ecloud/i686_Linux</td>
</tr>
<tr>
<td>Windows</td>
<td>C:\ECloud\i686_win32</td>
</tr>
<tr>
<td>Solaris SPARC</td>
<td>/opt/ecloud/sun4u_SunOS</td>
</tr>
<tr>
<td>Solaris x86</td>
<td>/opt/ecloud/i686_SunOS5.10</td>
</tr>
</tbody>
</table>

**Log Files**

<table>
<thead>
<tr>
<th>Platform</th>
<th>Install Log</th>
<th>Agent Log</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux</td>
<td>/opt/ecloud/install_$timestamp.log</td>
<td>/var/log/ecagent?.log</td>
</tr>
<tr>
<td>Windows</td>
<td>C:\ECloud\install_$timestamp.log</td>
<td>&lt;ECloud Install&gt;\ecagent?.log</td>
</tr>
<tr>
<td>Solaris SPARC</td>
<td>/opt/ecloud/install_$timestamp.log</td>
<td>/var/log/ecagent?.log</td>
</tr>
<tr>
<td>Solaris x86</td>
<td>/opt/ecloud/install_$timestamp.log</td>
<td>/var/log/ecagent?.log</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Platform</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux</td>
<td>/tmp</td>
</tr>
</tbody>
</table>
| Windows         | C:\WINDO\Temp
| Solaris SPARC   | /tmp     |
| Solaris x86     | /tmp     |
Chapter 4: Configuring ElectricAccelerator

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 Licensing
Your Accelerator license determines the usage to which you are entitled. If you have not received your license file, contact Electric Cloud technical support.

The license file includes the expiration date, grace period, maximum number of agents, and the 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 license file that was last imported.

JobCache is an add-on option that can substantially reduce compilation time. It requires a separately purchased license. The maximum number of builds that may use it simultaneously is read from the jobcacheMax property in the license file. Simultaneous builds in excess of this number will occur without using this feature.

If the JobCache license entry 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.

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 screen. 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.

![Login Screen]

2. Type in your user name and password. For a new installation, the default admin account user name and password are admin and changeme respectively; for an upgrade, the default admin account user name and password are admin and <previous password> respectively. Click Login.

3. When the Security Alert screen appears, click Yes to proceed or View Certificate to install the certificate.

If you clicked Yes, the ElectricAccelerator Home page appears next. If you have not installed your ElectricAccelerator license, an advisory message appears in the top-left portion of the web page as shown in the following screen.
4. On the right side of this page, click **Import License**, and the Import License page appears.

5. Use one of the following methods to install your license:
   - **Browse** for your license file and click **Upload File**.
   - Open your Accelerator license file, copy and paste the text to the Data field and click **OK**.

After the ElectricAccelerator license is installed, you can get familiar with home page features, complete remaining **Configuring ElectricAccelerator** tasks, 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 your 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.
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:

```plaintext
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:

```plaintext
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.

<table>
<thead>
<tr>
<th>Script</th>
<th>Description</th>
<th>Input argument</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>checkResource.tcl</td>
<td>Checks whether a resource string is valid.</td>
<td>Resource string in &quot;bsub -R&quot; (same as in --emake-resource)</td>
<td>&quot;true&quot; if the string is valid, &quot;false&quot; otherwise.</td>
</tr>
<tr>
<td>initialize.tcl</td>
<td>Checks whether the grid setup is ready (for example, already &quot;source profile.lsf&quot; from LSF, can run b* commands, and so on)</td>
<td>none</td>
<td>&quot;true&quot; if the grid setup is ready and initialized, &quot;false&quot; otherwise.</td>
</tr>
</tbody>
</table>
### Chapter 4: Configuring ElectricAccelerator

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

#### Grid Host Manager Examples

**checkResource.tcl**

```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
$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
$output
$::errorInfo" >> cloud/cloud.log
    puts "error in executing $executable"
    puts $::errorInfo
    exit 1
}
```

**initialize.tcl**

```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"
```
ElectricAccelerator

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
$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
$output
$::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
$output" >> cloud/cloud.log
    if [regexp {No unfinished job found} $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
$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
    } else {
    }
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** 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 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 includes
  ○ Building Visual Studio solutions and projects from within the Visual Studio IDE using eMake

- ElectricAccelerator Release Notes includes
  ○ Latest feature changes, fixes, and known issues
  ○ Installation and upgrade notes

- The Electric Cloud technical support website (https://electriccloud.zendesk.com/home) includes
  ○ Knowledge base articles
  ○ User forums

- The Electric Cloud "Ask" site at http://ask.electric-cloud.com
  ○ Ask questions
  ○ Get help with installation and configuration
Chapter 5: Upgrade

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 any component completely replaces the current installation on that machine. Only one Accelerator installation can exist on a machine and it is whatever combination of components were chosen from the most recent install. For example, installing the Cluster Manager on a machine with the Electric Agent, results in a machine with Cluster Manager only, not a machine with the Electric Agent and Cluster Manager.

**Cluster Manager**

**Notes:**

- Ensure no builds are running before beginning a Cluster Manager upgrade.
- The Cluster Manager server and agent hosts must run the same version of Accelerator.
- If you are changing Cluster Manager ports during the upgrade, Electric Cloud recommends closing your browser windows to avoid potential conflicts and to ensure your settings take effect.
- 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.
- Remote database configuration upgrade triggers 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 allows the installer to finish. Upon completion, a warning message is displayed. This is the expected behavior and does not indicate an actual issue.

- Duration of database schema upgrade triggers extraneous failure message.

  During the ElectricAccelerator upgrade process, the installer attempts to connect to the Cluster Manager. Because the Cluster Manager handles the database schema upgrade, having 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 come up might be displayed. This dialog does not indicate an actual failure, it 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*. 
• 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. Double-click ElectricAccelerator-<version> to start the upgrade.
   The Welcome screen appears after the installation packages are extracted.
3. Proceed with the upgrade in the same way you initially installed Cluster Manager.
4. Ensure you type in the correct value for your Cluster Manager admin password. The encrypted default value is change. 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.
5. Accept the existing Cluster Manager configuration or update your configuration settings.
6. When the Start Copying Files screen appears, click Next.
7. 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 Upgrade the Cluster Manager

1. Log in as root.
2. Run chmod +x on the installer (ElectricAccelerator-<version>) to ensure it is executable.
3. Run ./<installer_filename> --mode console to start the upgrade.
4. Enter 3 to select the Cluster Manager package. Press Enter.
5. Enter configuration details for the Cluster Manager upgrade.
   ◦ Accept the default listening port you specified during initial Cluster Manager installation.
   ◦ Accept the default database listening port you specified during 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 first upgrade the Cluster Manager (to update the existing database’s schema), then migrate the database to the new machine.
The installer upgrades Cluster Manager using the configuration details you entered, followed by “Installation complete” when the upgrade completes.

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

Electric Agent/EFS

Notes:

- The Cluster Manager server and agent hosts must run the same version of Accelerator.
- Ensure no builds are running before beginning an Electric Agent/EFS upgrade.
- Do not run the installer from a directory path that contains spaces.
- After agents on the grid are upgraded, they do not re-register with the Cluster Manager until a build runs. This means 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 install log might show the upgrade has failed, but only until the next build is run.

Upgrading Electric Agent/EFS on Multiple Hosts Simultaneously

If you have 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/ecloud/install.props before running ecclusterupgrade.

1. Copy the installer executable to the Cluster Manager machine to a location such as /var/tmp.
2. On the Cluster Manager machine, run:

   ecclusterupgrade

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

   - --agentinstallldir=<path> indicates the agents’ install location. The upgrade expects that all agents you want to upgrade have the same install location. If this is not true, you must run the script multiple times using the relevant --agentinstallldir path names. You must specify the --hosts option also to limit the upgrade to those machines that use the “non-standard” agent install directory.
   - --targetos=<os> limits which operating system to upgrade. <os> indicates which operating system to update. Available values are windows, linux, and solaris. This allows you to update any target 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].
   - If you have multiple installer versions, use:
     - --installerversion=<version> to select the version you want to use. You need this option only if there are multiple installer versions in the local|--installldir location.
     or
     - --installer=<filename> to explicitly select an installer. Use an absolute file name for this option.

   See ecclusterupgrade Options for all ecclusterupgrade options.

Example ecclusterupgrade Command

This command upgrades only agent1 and agent2:

```
/opt/ecloud/i686Linux/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. Double-click ElectricAccelerator-<version> to start the upgrade. The Welcome screen appears after the installation packages are extracted.
   
   Click Next to continue.
3. Select Electric Agent, and click Next.
4. 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. Click Next to continue to the next screen.
5. When the Start Copying Files screen appears, click Next.
6. The Installing screen displays while the upgrade progresses. When the upgrade is finished, the Complete screen displays. Click Finish.
7. Reboot the agent machine after the upgrade.

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

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

1. Log in as root.
2. Run chmod +x on the installer (ElectricAccelerator-<version>) to ensure it is executable.
3. Run ./<installer filename> --mode console to start the upgrade.
4. Enter 1 to select the Electric Agent/EFS package. Press Enter.
5. Enter configuration details for the Electric Agent/EFS upgrade.

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

   The installer upgrades Electric Agent/EFS using the configuration details you entered, followed by “Installation complete” when the upgrade completes.
6. You might receive a message to reboot the agent machine after upgrading Electric Agent/EFS—rebooting might not be required.

   **Note:** The installer dynamically builds the EFS kernel module if it detects it does not have a prebuilt version matching your Linux kernel version.

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

Electric Make

**Upgrading Electric Make**

To upgrade an Electric Make installation, simply overwrite the existing Electric Make version using the same procedure as your initial eMake installation.

**Note:** If you are considering uninstalling Electric Make prior to upgrading your current version, be advised that if Electric Make and Cluster Manager are installed on the same machine, you will remove Cluster Manager when you uninstall Electric Make.
Upgrading ElectricAccelerator on Windows

**IMPORTANT:** Installing any component completely replaces the current installation on that machine. Only one Accelerator installation can exist on a machine and it is whatever combination of components were chosen from the most recent install. For example, installing the Cluster Manager on a machine with the Electric Agent, results in a machine with Cluster Manager only, not a machine with the Electric Agent and Cluster Manager.

### Cluster Manager

**Notes:**

- Ensure no builds are running before beginning a Cluster Manager upgrade.
- The Cluster Manager server and agent hosts must run the same version of Accelerator.
- If you are changing Cluster Manager ports during the upgrade, Electric Cloud recommends closing your browser windows to avoid potential conflicts and to ensure your settings take effect.
- 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.
- Remote database configuration upgrade triggers 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 allows the installer to finish. Upon completion, a warning message is displayed. This is the expected behavior and does not indicate an actual issue.

- Duration of database schema upgrade triggers extraneous failure message.

  During the ElectricAccelerator upgrade process, the installer attempts to connect to the Cluster Manager. Because the Cluster Manager handles the database schema upgrade, having 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 come up might be displayed. This dialog does not indicate an actual failure, it 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*. 
• 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.

Upgrading the Cluster Manager

1. Log in as Administrator.

2. Double-click ElectricAccelerator-<version> to start the upgrade.

   The Welcome screen appears after the installation packages are extracted.

3. Proceed with the upgrade in the same way you initially installed Cluster Manager.

4. Ensure you type in the correct value for your Cluster Manager admin password. The encrypted default value 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.

5. Accept the existing Cluster Manager configuration or update your configuration settings.

6. When the Start Copying Files screen appears, click Next.

7. 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.

Electric Agent/EFS

Notes:

• The Cluster Manager server and agent hosts must run the same version of Accelerator.

• Ensure no builds are running before beginning an Electric Agent/EFS upgrade.

• Do not run the installer from a directory path that contains spaces (such as the Windows desktop).

• After agents on the grid are upgraded, they do not re-register with the Cluster Manager until a build runs. This means 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 install log might show the upgrade has failed, but only until the next build is run.

Upgrading 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 due to a Windows 7 issue. The workaround is to run cmd using “Run as administrator” and then run ecclusterupgrade.

1. Copy the installer executable to the Cluster Manager machine to a location such as c:\temp.

2. On the Cluster Manager machine, cd to the Accelerator bin directory and run:

```bash
ecclusterupgrade.exe```
3. Depending on your setup, you might require the following options as well:

   - `--agentinstallldir=<path>` indicates the agents' install location. The upgrade expects that all agents you want to upgrade have the same install location. If this is not true, you must run the script multiple times using the relevant `--agentinstallldir` path names. You must specify this option also to limit the upgrade to those machines that use the "non-standard" agent install directory.

   - `--targetos=<os>` limits which operating system to upgrade. `<os>` indicates which operating system to update. Available values are windows, linux, and solaris. This allows you to update any target 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]`.

   - If you have multiple installer versions, use:
     - `--installerversion=<version>` to select the version you want to use. You need this option only if there are multiple installer versions in the `local/<!--installerdir>` location.
     - or
     - `--installer=<filename>` to explicitly select an installer. Use an absolute file name for this option.

See `ecclusterupgrade Options` for all ecclusterupgrade options.

Example ecclusterupgrade Command

This command upgrades only agent1 and agent2:

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

Upgrading 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 very important exception, detailed below.

1. Log in as Administrator.

2. Double-click ElectricAccelerator-<version> to start the upgrade. The Welcome screen appears after the installation packages are extracted.

   Click **Next** to continue

3. Select Electric Agent, and click **Next**.

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

5. 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(s) for your build—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 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, refer to Using the ecconfig Command-Line Option.

6. When the Start Copying Files screen appears, click **Next**.
7. The Installing screen displays while the upgrade progresses. When the upgrade is finished, the Complete screen displays. Click **Finish**.
8. Reboot the agent machine after the upgrade.

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

**Electric Make**

**Upgrading Electric Make**

To upgrade an Electric Make installation, simply overwrite the existing Electric Make version using the same procedure as your initial eMake installation.

**Note:** If you are considering uninstalling Electric Make prior to upgrading your current version, be advised that if Electric Make and Cluster Manager are installed on the same machine, you will remove Cluster Manager when you uninstall Electric Make.

**Using the ecconfig Command-Line Option**

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

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>-cm value</code></td>
<td>Hostport of the Cluster Manager the agent host should point to.</td>
</tr>
<tr>
<td><code>-numagents value</code></td>
<td>This is the number of agents to start <code>&lt;xx&gt;</code>. If you modify numagents, you must restart the agents for your change to take effect. After the restart, the server database is updated and the agents become active.</td>
</tr>
</tbody>
</table>
| `-agentusers value` | Specify agent usernames and passwords: `-agentusers “username1/password1 username2/password2...usernameN/passwordN.”
Note: You must specify the same number of username/password pairs as the number of agents. The argument must be encapsulated in quotes. |
| `-agentuser value` | Specify a username and password for a specific agent: `-agentuser “agentID username/password” where agent ID is the numerical ID of the agent to configure (between 1 and numagents). |
| `-lsfhost value` | `y` or `n`. Type “`y`” to specify this machine is part of an LSF grid or “`n`” for no. |
### Argument Description

- **-secureconsole value**
  y or n. Type “y” to secure the agent console port or “n” for no.

- **-tempdir value**
  This is the location where agents should store temp files. Blank for system tempdir.

- **-help or -?**
  Print this message.

### ecclusterupgrade Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>--admin-password=value</td>
<td>The Cluster Manager admin user's password. Default is 'changeme'.</td>
</tr>
<tr>
<td>--agentinstalldir=path</td>
<td>The agent side install directory. You must specify the --hosts option also to limit the upgrade to those machines that use the “non-standard” agent install directory.</td>
</tr>
<tr>
<td>--batchsize=int</td>
<td>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.</td>
</tr>
<tr>
<td>--cm=host[:port[:securePort]]</td>
<td>Cluster Manager whose hosts are to be upgraded. Default is localhost:8030:8031.</td>
</tr>
<tr>
<td>--cm-secure-port=port</td>
<td>Cluster Manager secure port. Default is 8031.</td>
</tr>
<tr>
<td>--gen-hostlist</td>
<td>Query the Cluster Manager to get the list of hosts, write it to a file, and exit.</td>
</tr>
<tr>
<td>--help</td>
<td>Display this table’s help text.</td>
</tr>
<tr>
<td>--hosts=&quot;host1 host2 ...&quot;</td>
<td>List of hosts to upgrade. Can be a pattern like host[1-3], host[2,5]. This switch supersedes --cm.</td>
</tr>
<tr>
<td>--installer=filename</td>
<td>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 --installerdir.</td>
</tr>
<tr>
<td>--installerdir=dirname</td>
<td>The directory containing the installer executables.</td>
</tr>
</tbody>
</table>
### Option Description

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>--installerversion=version</code></td>
<td>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.</td>
</tr>
<tr>
<td><code>--installtimeout=value</code></td>
<td>The number of minutes to wait for the agent install to finish. Default is 20 minutes.</td>
</tr>
<tr>
<td><code>--logfile=value</code></td>
<td>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></td>
</tr>
<tr>
<td><code>--newcm=hostname/ip</code></td>
<td>The host name or IP address of the new Cluster Manager where you want to migrate the upgraded agents.</td>
</tr>
<tr>
<td><code>--remotetmpdir=path</code></td>
<td>The location where the remote install is run.</td>
</tr>
<tr>
<td><code>--targetos=os</code></td>
<td>Agent machine OS (windows, linux, solaris).</td>
</tr>
</tbody>
</table>
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/ecloud/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 as 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:
Chapter 6: Uninstalling ElectricAccelerator

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.

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