



ElectricFlow 7.0 Release Notes

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ElectricFlow 7.0

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ElectricFlow 7.0

ElectricFlow® 7.0 is a long-term support (LTS) release that rolls up the previous feature releases and also brings many new improvements around user interface, agent technologies, security, and efficiency. For more information about the ElectricFlow software release strategy, see the [ElectricFlow/ElectricCommander Release Strategy Update](#) announcement.

Product Description

ElectricFlow™ is an enterprise-grade DevOps Release Automation platform that simplifies provisioning, building, and releasing multi-tiered applications. Its model-driven approach to managing environments and applications lets teams coordinate multiple pipelines and releases across hybrid infrastructure in an efficient, predictable, and auditable way.

What's New or Modified

New Features and Functionality

ElectricFlow 7.0 provides several key updates to the Automation Platform and the ElectricFlow Deploy and Release modules.

Release Management Enhancements

- You can launch multiple instances of a pipeline that is associated with a release.
- You can create schedules for release runs. You can set a start date and can also make a run recurring (for example, daily or weekly).
- When starting a release run, you can select a previous run to use its parameters. You can modify one or more of these parameters for the run that you are starting.
- You can abort all pipeline runs in a release.
- The release list page is enhanced for navigation through multiple pipeline runs.

Pipeline Management Enhancements

- When running a pipeline, you can choose specific stages to run. (CEV-11702)
- When starting a pipeline run, you can choose a previous run to use its parameters. You can modify one or more of these parameters for the run that you are starting.
- You can create schedules for pipeline runs. You can set a start date and can also make a run recurring (for example, daily or weekly). (CEV-8696)
- You can choose whether to skip specific tasks in a task list for a stage. This lets you skip tasks at runtime.

Rollback Enhancements

- You can limit rollback only to components that undeployed successfully.
- You can trigger rollback even if an undeploy fails.
- You can activate rollback only on components that failed. You can use component-level rollback with automatic rollback and with snapshots.

Other Enhancements

- The central agent management capability for installing or upgrading a large number of remote agents is now available for Windows systems. The user interface for doing so is improved for Linux platforms.
- The Smart Undeploy feature lets you skip undeploy for a component if the component inventory does not exist.
- Environment reservation is improved so that when a blackout period is configured, deployments wait until the blackout period is over (given that the maximum job wait time is not exceeded) rather than fail.
- Environment reservation is extended to apply to future tier-level reservations.
- The job details page for rolling deployments no longer displays any phase that is skipped because there is no resource associated with it.
- The inline DSL editor is added to the visual editors for releases, applications, and pipelines. It provides a convenient way to view and edit the DSL from the visual editor for a release, application, or pipeline. Buttons let you toggle between the visual editor and the DSL editor.
- You can use the standard Groovy `println` method in DSL scripts to print messages to the client console while it is evaluated by the ElectricFlow DSL engine.
- The EC-FileSysRepo plugin is upgraded from version 0.0.5 to version 1.0.0. This upgrade provides support for a flexible artifacts file structure.

- This plugin provides strategies for retrieving the latest artifact version that can be configured based on the artifact versioning scheme in the file system.
- An `Overwrite` parameter is added to the Retrieve File Artifact procedure to control whether existing files should be overwritten in the target location. By default, the Retrieve File Artifact procedure does not overwrite existing files and fails with an error if files exist in the target location (unless the `Overwrite` option is enabled).

For existing users, version 0.0.5 overwrote any overlapping files without warning. Users upgrading from EC-FileSysRepo version 0.0.5 should update their scripts and application process to enable the `override` parameter if the Retrieve File Artifact procedure overwrote existing files in the target location.

- The Electric Flow installer and the `ecconfigure` tool are upgraded to support the full range of user-modifiable agent configuration settings, so that all modifications to agent configuration settings are preserved during agent upgrades.

For a few types of customizable configuration file lines where you could add any number of custom lines with custom values as long as the lines were numbered with integers ≥ 1000 , this limit is increased to ≥ 10000 .

- The following bundled plugins are updated to the latest versions: EC-WebSphere, EC-WebLogic, EC-JBoss, EC-Tomcat, and EC-IIS.
- The `createSnapshot` utility function is added to the EF-Utilities plugin.
- Support for artifacts on generic file systems is improved.

Feature Release Rollup

The following features were provided in earlier 6.x Feature Release versions of ElectricFlow and are listed here for their first appearance in an LTS version.

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- Native Rolling Deployment support for zero downtime updates to business critical applications, making it easy to model Rolling Deployment policies.
- Environment Reservation and Calendaring for conflict management. Managing resource conflicts across applications, releases and teams is crucial in highly distributed global enterprises. You can now reserve environments for applications, pipelines, or releases for guaranteed resource availability.

You can also define *blackout* periods for environments for planned maintenance work.

The Calendar views make it easy to visualize planned work and conflicts.

- Automated Environment Discovery for faster onboarding. ElectricFlow can discover resources in existing environments and automatically populate the resource configuration details, reducing the time to build deployment models.
 - You can run Resource discovery using middleware plugins, on existing resources and environments.

Supported out-of-the-box by EC-WebSphere.
 - You can use the discovered resource configurations to accelerate process authoring and deployment automation.

For details, see the “Auto-Discovery” section in the “Deployment Automation” chapter of the *ElectricFlow 6.5 User Guide*.

- The full-stack dependency view helps to visualize and manage dependencies. In distributed environments, different teams can be responsible for authoring applications and managing the infrastructure, and managing dependencies across the stack is crucial.

The full-stack dependency view shows a mapping between application tiers and environment to ensure that infrastructure capabilities can support the minimum application requirements.

- Nested LDAP Groups support

To use this feature, you must enable the following options.

- LDAP (includes Active Directory) group hierarchy for access control. (NMB-7558 and NMB-23622)

When the **Recursively Traverse Group Hierarchy** option is enabled for the directory provider and access control is set up for an LDAP group in ElectricFlow, the users belonging to any nested groups in LDAP will automatically inherit the access control rules defined for the parent groups. This option is disabled by default.

- Allow users from nested LDAP groups to complete or approve manual tasks. (NMB-23743)

If the **Recursively Traverse Group Hierarchy** and **Include Nested Group Users as Approvers** options are enabled for the directory provider, users in nested LDAP groups are allowed to complete or approve a manual task in a pipeline stage or gate when a parent LDAP group is an assignee or an approver for the task. The **Include Nested Group Users as Approvers** option is disabled by default.

- Include users from nested LDAP groups when sending notifications to a parent LDAP group. (NMB-23742)

If the **Recursively Traverse Group Hierarchy** and **Include Nested Group Users in Notifications** options are enabled for the directory provider, users in nested LDAP groups will be included when sending notifications to a parent LDAP group. The **Include Nested Group Users in Notifications** option is disabled by default.

For details, see the “Authenticating Users for LDAP and Active Directory” section and the “LDAP Group Hierarchy” section in the “Automation Platform” chapter of the *ElectricFlow 6.5 User Guide*.

- Searching and filtering enhancements

- You can search for projects, jobs, artifacts, artifact versions, or workflows directly from the object page without having to navigate to the Search tab in the platform UI. (NMB-9356 and NMB-23679)

Some of the search panel features are:

- Quick search: You can enter text in the text box and click **OK** to run a quick search.
- Search criteria: You can enter criteria to filter the results by specific attributes or properties on the selected object, and click **OK** to run the search.
- Saved searches: Save a search as a named saved search for later use.
- The page size or number of records per page drop-down options, which are displayed at the bottom of the Search result page, as well as on the object pages, can now be configured through a server property `ec_ui/pageSizeOptions`. The out-of-the-box values for this property are 10,20,50,100,250, and 500. (NMB-23937)

For details, see the “Searching and Filtering” section in the *ElectricFlow 6.5 User Guide*

- Export DSL files for Deploy and Release objects in one click.
- Support for the preconditions (**Wait until**) and run conditions (**Run if**) for Pipeline objects (stages, gates, and tasks) to control the process flow. (CEV-10892)

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Support for the Continue running or Stop running on error option in a Pipeline stage task, gate approvals and Deployer task. (CEV-11162)

- In a Pipeline, you can now set the error handling option for a stage task or gate to **Stop running** (the default) or **Continue running** if the stage task fails or the user rejects the gate approval.
- In a Release, when configuring the applications, you can specify the error handling behavior for individual applications. This information will be leveraged by the Deployer task to control its behavior during Release runs.

For example, two applications are in a Release, and the first application is marked to Stop running on error. When the Release is run and the first application deployment encounters an error, the Deployer will stop and return to the pipeline immediately. Based on the error handling setting in the Deployer task, the pipeline will determine whether to continue or stop running.

ElectricFlow 6.3:

- Support for a native rollback step in the application and component processes. This allows an automatic rollback to the environment before an erroneous deployment was attempted, or to any previous environment snapshot. This significantly shortens time to author the rollback logic.
- Artifact staging allows all the required artifacts to be downloaded and available locally on the target machines automatically before the deployment begins. This capability significantly reduces production downtime so that no time is spent in downloading large artifacts when servers are down.
- Support for manual process steps with parameter support in application and component processes. This allows human intervention to be included at various points during the deployment. With parameters, it is possible to take different paths based on user input during an active deployment. Parameter support has also been added the manual tasks in pipelines. (CEV-5117 and CEV-5669)
- Support for utility functions in application or component process steps and in pipeline stage tasks. A utility function is a higher-order operation than a third-party plugin that you can use in application and pipeline modeling.
- Support for using the Amazon Simple Storage Service (S3) web service as a backing store for a repository server. (NMB-22932)
- UI enhancements:
 - The Search functionality was added to the Applications List and Environments List UIs. (CEV-9878)
 - The “Applications / View Run” page showing the deployment details now has a “Re-run” button. (CEV-5649)
 - An application process can now be aborted from the “Applications / View Run” page using the Abort button. (CEV-4463)
- Branch conditions between process steps can be longer than 255 characters. (CEV-10915)
- Object descriptions now permit the use of hyperlinks. (CEV-9947)

- Clustering improvements:
 - Trusted agents—There are two ways to add a trusted agent to a cluster. You can now add trusted agents to a cluster without bringing down any nodes. For both procedures, see the “Adding Trusted Agents to Clusters” section in the Clustering chapter of the [ElectricFlow 6.3 Installation Guide](#).
 - Improved ZooKeeper's performance by removing old JGroups cluster information to prevent the JGroups partitions or delaying a node from joining a cluster, resulting in multiple clusters being created. (NMB-22922 and NMB-23502)
 - Clustering robustness (NMB-23263)

ElectricFlow 6.2

- Multiple Project support, which was mainly available for platform objects, has now been extended to objects such as applications, pipelines, Releases, environments, Master Components, resources, and environment templates. These objects as well as the objects belonging to them can now be in any project within ElectricFlow. (In releases earlier than ElectricFlow 6.2, these objects were limited to the “Default” project.)

This significantly improves management of these objects at scale by allowing:

- ACL inheritance—All objects in a project inherit the access control settings from the project, providing better security for all the objects. Before the ElectricFlow 6.2 release, objects such as applications, environments, and so on could only belong to the “Default” project so that users had to set up ACLs on each instance of these objects. Now they can be managed in their own projects and will inherit the ACLs setup at the project level. This will significantly simplify permissions management.
- Logical grouping—This will allow users to better manage Deploy and Release objects under various projects that are logically mapped by users, roles, geography, department, and so on, resulting in easier maintenance.
- Credential parameters can now be passed to pipelines at run time to ensure security when authoring and executing pipelines.
- For a component or application process step in an application, you can now choose credentials from projects other than the project of the application. However, the credential cannot be attached to an application process step that is linked to a component process with a credential parameter.
- Smart Deploy for Release runs—You can now run Releases using Smart Deploy, deploying only the artifacts that have not been deployed to a resource or specific versions of the artifacts that have not been deployed to new resources.
- Various usability improvements—This release contains usability enhancements including:
 - Improved rendering of truncated labels and long lists in the UI and improved breadcrumbs to identify the object you are viewing to show the object hierarchy (your current position or level within the project), and for easy return to previous pages, such as on the Pipelines List.
 - 24-hour format for timestamps.
 - Keyboard shortcuts such as Alt+S to save your settings and Alt+N to open windows or dialog boxes.
 - Filtering steps in the Job Details page in Deploy.

- Change tracking of non-project-owned objects (such as server properties, resources, artifacts, users, groups, and zones in addition to the property sheets, properties, and access control lists for them) can be disabled during the upgrade process to speed up upgrades.
- ElectricFlow 6.2 builds on the momentum of the “Process as Code” concept of the DSL introduced in prior releases. The ability to generate DSL from existing objects has now been strengthened significantly. This makes it much easier to get started and get value from the DSL.
- Trusted agents—You can now add trusted agents to a cluster without bringing down any nodes.
- Performance and Stability Improvements
- The performance of the CI dashboard screen has been significantly improved for faster load times. There are improvements to the load times of the Application and Environment lists for the ElectricFlow Deploy module. Additionally, critical Platform areas like Clustering, Change tracking, and Object deletions have been strengthened for reliable operation.
- Ability to specify parameters in Deploy objects (such as application process step, components, and artifact versions) using the “\$[]” notation that are expanded later at the application run time.

ElectricFlow 6.1

ElectricFlow 6.1 introduces the new ElectricFlow Release module for capturing, executing, visualizing, and controlling the life cycle of multi-application releases. ElectricFlow 6.1 also contains improvements to the ElectricFlow Deploy module and the ElectricFlow platform.

- Pipelines—Pipelines are a new capability that enables you to easily model a reusable pathway to production across multiple stages and environments and provide an aggregated view of all the activity. Pipelines provide:
 - Control of delivery process flow—Stages (groupings of tasks) and gates between stages, for automated and manual approvals, enabling high-level viewing and control of progress.
 - Coordinated execution—Flexibility to automate software delivery with tasks that leverage application processes, procedures, workflows, manual tasks, and plugins to integrate with third-party tools.
 - Visualization of the entire process—Intuitive, contextual status and drill-down troubleshooting of running and completed pipeline activities.

- Releases—Releases capture, manage, and visualize all the details of multi-application enterprise releases, where outputs from multiple teams are coordinated to produce the final release being pushed into production. This brings a high level of visibility around the health of releases across the organization, and offers quick access to dig deeper into the details. Releases provide:
 - Release dashboard—A bird's eye view of all the releases that are planned, active, or complete. For each release, teams get quick visibility including: if the release is in progress, milestone dates, if the release is blocked waiting for manual approval, and how far the release has progressed.
 - Path-to-production view—At-a-glance visuals to help release teams quickly isolate which environments are not in compliance with the release bill of materials, as well as up-to-date information on which application versions are installed onto any environment in the release.
 - Multi-application enterprise releases—The Release module captures, validates, coordinates, and executes on the many details that need to be managed to achieve a successful release. It provides a transparent and collaborative record of the release, all of its activities, and its health.
- Deploy Master Component by Reference—Master components are enhanced in ElectricFlow 6.1 to support *referencing* in addition to creating by copy. Authors can manage master component definitions centrally, and any changes to the definitions are automatically inherited by the relevant applications. The *reference* capability coupled with the *copy* capability allows application authors the flexibility and reusability to drive best practices.
- Various usability improvements—This release contains usability enhancements such as a new home page, extensible navigation menus, and improved breadcrumbs for better traceability.
- ElectricFlow Help Center—A centralized location for easy access to video tutorials, knowledge-based articles, community discussions and assistance, and product documentation.
- Support for Oracle 12.
- The ElectricFlow installer now supports 32-bit compatibility libraries for 64-bit agents.
- Maintenance Release roll ups—This feature release rolls up the fixes made in the ElectricFlow 6.0.1 maintenance release. For more details, see the [ElectricFlow 6.0.1 Release Notes](#).

New Platforms

Support is added for the following platforms:

- RHEL 7 (64-bit for servers; 32-bit and 64-bit for agents) (NMB-24000)
- CentOS 7 (64-bit for servers; 32-bit and 64-bit for agents) (NMB-24000)
- Windows 10 (64-bit for servers; 32-bit and 64-bit for agents) (NMB-23369)

Database Support

- Oracle 10g Release 2 (including RAC) is no longer supported.
- MySQL versions 5.0 and 5.1 are no longer supported.

Resolved Issues

Security-Related Issues

- The HTTP TRACE and TRACK methods are now disabled. This update fixes the following Common Vulnerabilities and Exposures (CVEs). (NMB-24277 and NMB-24121)
 - [CVE-2003-1567](#)
 - [CVE-2004-2320](#)
 - [CVE-2010-0386](#)
- For improved security, performance, and compatibility, the ElectricFlow third-party technology stack is updated. (NMB-24082, NMB-23948, NMB-23987, and NMB-23932)
 - PHP is upgraded to version 5.6.25.
 - OpenSSL is upgraded to version 1.0.1t.
 - Apache is upgraded to version 2.2.31.
- Cross-site request forgery (CSRF) protection is enabled by default. (You must disable CSRF if you have disabled HTTPS.)

Other Resolved Issues

- The “Setting the Database with ectool” section in the *ElectricFlow 7.0 Installation Guide* contains several improvements, including clarification about whether to restart the ElectricFlow server after using the `ectool setDatabaseConfiguration` command. (NMB-24191)
- Stage approvers (or users) for a group now work in a nested group. (NMB-24179)
- Performance for nested LDAP groups is improved. (NMB-24166)
- Questions about database performance optimization recommendations for inputs and implementation are answered. (NMB-24143)
- A constraint violation that could arise when inserting notifiers to a job is fixed. (NMB-24067)
- A `NullPointerException` no longer occurs during `expandJobStep` when the step is a subprocedure whose project resolves to null. This occurred because the procedure from which the job was run was deleted while it was running. (NMB-24002)
- Artifacts with names that contain spaces can now be retrieved. (NMB-23985)
- The information about configuring a local agent as trusted in the “Adding Trusted Agents to Clusters” section in the *ElectricFlow 7.0 Installation Guide* is updated. (NMB-23913)
- The **Artifact > Artifact Versions** page in the ElectricFlow user interface can now display more than 25 files per directory. (NMB-23899)
- If a plugin fails to install (such as when a newer version existed), error messages no longer appear in the running event log when starting a server for the first time. (NMB-23896)
- The “Unknown exception during DSL eval” issue because of a `java.lang.NullPointerException` is fixed. (NMB-23893)
- Properties exported using the `/properties/property_name` path format no longer fail to import on the same path. (NMB-23857)

- Information is added to the *ElectricFlow 7.0 User Guide* to note that resources for the actual gateway agents behind the load balancer in ElectricFlow must not be registered and that the actual gateway agents should be pinged by ElectricFlow only via the load balancer. (NMB-23809)
- The description of createJobStep options in the documentation is improved. (NMB-23715)
- The command reference documentation for the waitForJob API command is improved. (NMB-23666)
- The focus upon deletion of a resource or resource pool now goes to the confirmation dialog. (NMB-23617)
- You can now run the EC-AgentManagement install agent as sudo. (NMB-23351)
- Using preconditions with bad property reference syntax on a step no longer causes unstable behavior in the entire job. (NMB-23318)
- Corrected an issue where the hourly PingAllResourcesOperation for a large number of AWS agents could cause the Gateway agent ping to timeout and cause a “gateway down” error. (NMB-22849)
- The “Hardware Requirements” section in the *ElectricFlow 7.0 Installation Guide* is updated to properly specify the number of processors required. (NMB-22848)
- The font color for the error that appears when a procedure step references a nonexistent property is changed for readability. (NMB-22717)
- The build numbers in artifact versions in the two formats `<major>.<minor>.<revision>-<build>` and `<major>.<minor>.<revision>.<build>` are now parsed consistently. (NMB-22510)
- The Windows platform is now present in the list of platforms in the **Run Procedure - Publish Installer** dialog box. (NMB-20031)
- The help page for the WebSphere plugin now contains additional release information. (NMB-18829)
- mysql references are removed from .profile scripts in UNIX installations. (NMB-18770)
- A procedure is added to the *ElectricFlow 7.0 Installation Guide* to prevent changes to the ElectricFlow database during a full export. (NMB-17302)
- You can now add multiple resources to a resourcePool with DSL. (CEV-12334)
- Documentation is added for usage of special characters when naming ElectricFlow objects. (CEV-12275)
- The pagination-related options (firstResult and maxResults) of the getWaitingTasks API command are removed. (CEV-12200)
- Invoking a rollback step no longer causes a warning from the runCommand step of the uninstall call because of an uninitialized variable. (CEV-12188)
- The issue with the rollback step's expandJobStep failing with “java.lang.ClassCastException” (which appeared to be a rollback step waiting on preconditions) is fixed. (CEV-12027)
- Stage scheduling for releases and pipelines is now supported. (CEV-11950)
- Proceeding with rollback after the undeploy portion of a rollback no longer fails. (CEV-11864)
- The user interface issue where the application process cannot unselect a workspace is fixed. (CEV-11707)
- About 300 tool tips are added to links in the ElectricFlow Deploy user interface. (CEV-11490)

- The “java.lang.NullPointerException: element cannot be mapped to a null key” error when calling `ectool getPipelineRuntimeDetails --flowRuntimeIds` on a gate or state flowRuntime is fixed. (CEV-11391)
- The flag for enabling a task is no longer ignored. (CEV-11263)
- The arguments for branchType are now documented. (CEV-11169)
- Disabling pipeline tasks now works. (CEV-11159)
- The `pruneChangeHistory` command no longer throws an “org.hibernate.hql.internal.ast.QuerySyntaxException” error if change tracking is disabled at a global level. (NMB-24173 and NMB-23325)
- The background deleter no longer hangs when a constraint violation is thrown. (NMB-22169, NMB-23685, NMB-23134, NMB-22207, NMB-23135, and NMB-23635)

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- Artifacts can now be retrieved through the UI if it contains a file with spaces in the file name. (NMB-23855)
- Added a security fix for Cross-Site Request Forgery (CSRF) Protection. (NMB-23849)
- Parameters can now be passed to ec-groovy. (NMB-23829)
- Classpath can now be configured with ec-groovy using `-cp` or `-classpath`. (NMB-23472)
- The `getProjects` DSL method no longer requires the Modify privilege to read properties. (NMB-23803)
- Artifact retrieval now works for artifacts larger than 2 GB. (NMB-23774)
- The artifact repository server now has a current certificate. (NMB-23003)
- Artifacts can have names with double-byte character set (DBCS). (NMB-22680)
- The result of sorting the schedules now stays in the Schedules tab on the Project Details page. (NMB-22364)
- The Job Details page no longer displays the “HTTP error 500” error when dynamic jobs are running. (NMB-19946)
- Performance on the **Cloud > Resources** page has been improved. (NMB-16485)
- Property substitution now works in email notifiers. (CEV-11885)
- Active directory users can now be selected as assignees in manual tasks and manual steps. These assignees, specified at runtime, can receive email notifications and perform the manual task or step. (CEV-11843)
- Rollback now works when the last successful process runs as done using a snapshot. (CEV-11808)
- Clicking on the circle of progress now navigates the user of the running pipeline when the stage name contained a “/” character. (CEV-11606)
- The job summary for a pipeline now renders correctly when the pipeline has an error. (CEV-11425)
- You can now edit the name of a pipeline and its related objects to have a different case. (CEV-11409)
- The link in the notification sent out for manual task in a pipeline stage is now clickable and can be used to navigate to the stage even if the stage name contains a “/” character. (CEV-11404)

- Rollback now works when the rollback version contains steps that ran with a warning outcome. (CEV-11383)
- The Job Details page no longer renders slowly in Microsoft Internet Explorer 11. (CEV-11361)
- The reference `/myEnvironmentTier/environmentTierName` now works when an application mapped to an environment belonging to a different project is deployed. (CEV-11320)
- ACL operations now work in a DSL script. (CEV-11272)
- The environment inventory record for a disabled resource is not updated if it has the same component version deployed. (CEV-11262)
- The Chef configuration parameters are now displayed when Chef is selected in the Resource Template Details dialog box in the UI. (CEV-11183)
- After scheduling an application deployment, the message shows both the date and time that the application will be deployed. (CEV-11150)
- In the dialog box to define a stage task, the field to select a snapshot has been renamed from **Select a Snapshot** to **Select Snapshot**. (CEV-10549)
- The text alignment in the Deploy UI fields is now consistent. (CEV-9747)

Installation and Upgrade Notes

- For complete installation and upgrade information, see the *ElectricFlow 6.0.6 Installation Guide* at http://docs.electric-cloud.com/eflow_doc/FlowIndex.html.

New capabilities such as Release and Pipelines are part of a separately licensed ElectricFlow Release module.

- In `DATA_DIR/conf/wrapper.conf`, change the default prefix for StatsD as follows. (NMB-22835)

from

```
wrapper.java.additional.802=-DCOMMANDER_STATSD_PREFIX=commander
```

to

```
wrapper.java.additional.802=-DCOMMANDER_STATSD_PREFIX=flow
```

- In the Oracle database, set the `OPEN_CURSORS` parameter to at least 1000 to prevent ElectricFlow from running out of open cursors.

IMPORTANT: Before beginning the upgrade, back up your ElectricFlow data.

Upgrading Your Existing ElectricFlow Environment

- Upgrades to ElectricFlow 7.x are supported only from ElectricCommander 4.2.x or from ElectricFlow 5.x. ElectricCommander systems and servers that are pre-Commander 4.2.x must be upgraded to an ElectricCommander 4.2.x release. For upgrade instructions, see the *ElectricFlow 6.0.6 Installation Guide* at http://docs.electric-cloud.com/eflow_doc/FlowIndex.html.
- Upgrading to ElectricFlow 7.x from ElectricCommander 4.2.x requires a database upgrade.
- You cannot upgrade the ElectricCommander 4.2.x built-in database to an ElectricFlow 7.x database. If you want to continue using the built-in database in ElectricFlow 7.x, follow the database upgrade procedures described in the *ElectricFlow 6.0.6 Installation Guide*.

Behavior Changes

- The `startingStageName` argument of the `createSchedule` and `modifySchedule` API commands is changed to `startingStage`. (CEV-12187)
- The **Linux** platform option in the Publish Installer procedure in the EC-AgentManagement plugin is replaced with the **Linux-x86** and **Linux-x64** options.
- The EC-AgentManagement plugin no longer publishes the full installer that includes both the server and the agent. It publishes only the agent-only installer for the selected platform.
- The pagination-related options (`firstResult` and `maxResults`) of the `getWaitingTasks` API command are removed.

Feature Release Rollup

The following features caused behavior changes in earlier 6.x Feature Release versions of ElectricFlow and are listed here for their first appearance in an LTS version.

ElectricFlow 6.5

- The inventory record is updated as soon as a component process is completed. (CEV-11986)
- The default value for the `timeout` argument in the `evalDsl` API command changed from 30 seconds to 5 minutes. This argument defaults to the `maxDslDuration` server setting. (NMB-23910)
- Nested LDAP Groups support
 - When the directory provider is configured to **Recursively Traverse Group Hierarchy**, the User Details page for the external or remote user displays all the parent groups in the LDAP or Active Directory server hierarchy in which the user's immediate groups are members. (NMB-23746)
 - When the directory provider is configured to **Recursively Traverse Group Hierarchy**, the Group Details page for the external or remote group displays all the nested groups that are members of this group's hierarchy in the LDAP or Active Directory server. (NMB-23745)
 - When the directory provider is configured to **Recursively Traverse Group Hierarchy**, you can use the `traverseHierarchy` argument in the `getGroup` API to include nested LDAP groups in the result. (NMB-23996)
 - When the directory provider is configured to **Recursively Traverse Group Hierarchy**, you can use the `traverseHierarchy` argument in the `getUser` API to include parent LDAP groups in the result. (NMB-23996)

- Search page layout improvements (NMB-23678)
 - The **Records per page** input field on the Search page has been removed. The user selection for the records per page drop-down field on the Search Results page will control the number of records displayed per page.
 - The **Number of Results** input field on the Search page has been removed. The maximum number of search results that will be returned on the Search Results page is now controlled by the server property `ec_ui/maxIds/default`. The out-of-the box default for this property is 1000. This default can be overridden for a specific object type as has been done for jobs. The maximum number of jobs to display is now controlled using the server property `ec_ui/maxIds/job` that is set to 500 out-of-the box.
 - If the number of objects that meet the search criteria exceed the maximum number of objects that can be returned, the object count will be displayed with a '+' on the Search result page and the object list pages. An example is *(1000+ Results)*. You can use this visual cue to add additional filters to narrow down the search result.
- **Cloud > Resources** UI Changes
 - The maximum number of search results that will be returned on the Search Results page is now controlled by the server property `ec_ui/maxIds/default`. The out-of-the box default for this property is 1000.
 - If the number of objects that meet the search criteria exceed the maximum number of objects that can be returned, the object count will be displayed with a '+' on the Search result page and the object list pages. An example is *(1000+ Results)*. You can use this visual cue to add additional filters to narrow down the search result.
 - Sorting resources by resource pool will not be supported. (NMB-23759)

ElectricFlow 6.4

- The pipeline stage summary now displays a message when a manual process step is rejected. (CEV-11221)
- Email notifications are sent and ACLs are enforced on a manual process step when the assignee is a global property with an active directory user name as its value. (CEV-11210)
- The `getProcessDependencies` response now includes the `sourceProcessStepName` and `targetProcessStepName`. (CEV-11195)
- For ACL operations in a step in a DSL script (CEV-11168):
 - `objectType` is now a required argument for the `aclEntry` DSL method.
 - `objectType` is now an optional argument for the `breakAclInheritance`, `checkAccess`, `createAclEntry`, `deleteAclEntry`, `getAccess`, `getAclEntry`, `modifyAclEntry`, and `restoreAclInheritance` API commands.
 - For instructions on how to create or update access control for an object, see the "Troubleshooting and FAQs" section in the "Using the ElectricFlow DSL" chapter of the [ElectricFlow 6.4 API Guide](#) or in the **Using the ElectricFlow DSL > Troubleshooting and FAQ** topic in the embedded platform Help.

ElectricFlow 6.3

- Use the `waitForFlowRuntime` API command to make the system wait until the pipeline is completed or the timeout expires before process flow resumes. (CEV-10504)
- The `service.log` file produced by the Java Service Wrapper has been renamed to start with a prefix for the name of the component that the service is running, such as `commander-service.log`, `repository-service.log`, or `jagent-service.log`. (NMB-23201)

ElectricFlow 6.2

- When resources in resource pool are disabled, the system skips these resources and treats them as if they do not exist during an application deployment. The skipped resources are identified as compliance issues in the environment inventory. (CEV-9659)

ElectricFlow 6.1

- When naming processes, do not include slashes (/) in the name. (CEV-9265)

ElectricFlow 6.0.4

- The `service.log` file produced by the Java Service Wrapper has been renamed to start with a prefix for the name of the component that the service is running, such as `commander-service.log`, `repository-service.log`, or `jagent-service.log`. (NMB-23201)

ElectricFlow 6.0.2

- When resources in resource pool are disabled, the system skips these resources and treats them as if they do not exist during an application deployment. The skipped resources are identified as compliance issues in the environment inventory. (CEV-9659)

ElectricFlow 6.0.1

- Use the `reducedDetailChangeHistory` argument in the `export` API call when exporting a project with Change Tracking enabled but not allow changes to be tracked when ElectricFlow exports part or all server data to an XML file. Follow these usage guidelines (CEV-7785):
 - The argument is a Boolean argument: `<Boolean flag - 0|1|true|false>`.
 - Use this argument for large projects containing over 20,000 audited objects with Change Tracking enabled.
 - When this argument is set to `true` or `1`, ElectricFlow automatically decreases the amount of Change History indexing information that it saves in a large project, reducing the level of detail for Change Tracking-intensive operations in the Change History. This can make it harder to revert an object to a specific state and to find information in the Change History when you are troubleshooting or debugging an issue.
 - Set this argument to `false` or `0` to suppress to this behavior so that ElectricFlow does not change the amount of indexing information for a large project. This will cause the operation to take longer and put more load on the database, but the Change History will have the full details of the entities owned by objects in the project.

Configuration Notes

Performing a Full Import

When you do a full import, the import operation might hang in the following scenarios. To successfully import into ElectricFlow 7.0, perform the appropriate workaround (CEV-11873):

- A manual process step in a process has formal parameters. The workaround is to remove the entry related to the property sheet for the job step that is associated with the manual process step.
- In the exported XML file from the earlier release, two pipelines are in different projects and both pipelines have no gate tasks. The flow associated with the pipeline is duplicated under both projects. The workaround is to remove the flow element under the projects.

Updating Component Plugin Versions in the Export File When Upgrading from 4.2.x to 7.x

When you export your project data before upgrading from ElectricCommander 4.2.x to ElectricFlow 7.x, you must replace the component plugin versions, including EC-Artifact, in the export file before importing the project data to ElectricFlow 7.x. (CEV-6679)

Registering a Custom Plugin Procedure for the Step Creation Dialog

You must register a user-developed plugin so that it appears as an option: (CEV-3649)

- When you use the plugin to configure a step in a component or application process.
- In a procedure in the automation platform.

For details, see the “Register your procedure for the step creation dialog” section in the “Examples and Tutorials” chapter of the *ElectricFlow Plugin Developer Guide* at http://docs.electric-cloud.com/eflow_doc/FlowIndex.html.

Diffie-Hellman Key Size Incompatibility

To enable ElectricFlow server versions 7.0 or newer to configure Diffie-Hellman cipher suites properly, ElectricFlow uses OpenSSL-1.0.1T with SSLv2 enabled. Because of OpenSSL and JRE changes, the minimum Diffie-Hellman key size requirement is increased to 1024 bits (from 768 bits) as of version 7.0.

Server versions 7.0 or newer use Jetty (a Java HTTP server), which listens on the 8000 (unsecure) and 8443 (secure) ports. Server versions 7.0 or newer use Java 1.8.0_66, in which the ephemeral DH key size defaults to 1024 bits during SSL/TLS handshaking in the SunJSSE provider.

For details on the increase of the key size requirement as of Java 1.6-u101, see the Java release note at <http://www.oracle.com/technetwork/java/javase/overview-156328.html#6u101-b31>. For details as of Java 1.7-u85, see the Java release note at <http://www.oracle.com/technetwork/java/javase/7u85-relnotes-2587591.html>.

Because their minimum key size is 1024 bits, agent versions 7.0 or newer can connect only to:

- Server versions 5.4, 6.0.1, or 6.5 or higher via ectool
- External applications that require SSL with a minimum key size of 1024 bits

However, ElectricCommander agents of versions 5.0.6, 5.3, or 5.4 and ElectricFlow agent versions 6.0.1 or 6.5 or newer can connect to all ElectricFlow server versions (including 7.0 or newer) via ectool and ec-perl.

ElectricCommander server versions 5.0.6 or 5.3 or newer can run jobs using all agent versions (including 7.0 or newer). ElectricFlow server versions 7.0 or newer can run jobs using ElectricCommander agent versions 5.0.6 or 5.3 or newer.

Limitations

- When an application is cloned from one project (the original project) to another (the destination project), the tier maps for the application will point to the environments with the same names in the destination project. If you want to deploy the application to the environments in the original project, you must create tier maps connecting the application to those environments.
- When an assignee is added in a manual process step or stage task through the web interface, the Search field displays only the users who have actually logged into the system.
- Session management has the following limitations:
 - When a user logs out, they are logged out only on the node where the logout occurred.
 - When a user is deleted from the system, their session is active until it expires.
 - When a job ends, the user's session is active until it expires.

Known Issues

- In the Deploy UI, the **Projects**, **Workflows**, and **Credentials** options are missing from the **Automations > Procedures** side-navigation menu. To download the hotfix for this issue, log into the ShareFile site at <https://electric-cloud.sharefile.com> and navigate to the `./hotfixes/flow/release_7.0/ec_7.0-CEV-12546` folder. You can also access this folder directly at <https://electric-cloud.sharefile.com/app/#/home/shared/fo6915ef-771d-4596-9f17-2c7b9fcd0639>. (CEV-12546)
- Error messages for runtimes started by a schedule are not visible if the schedule was created with a missed configuration. (CEV-12363)
- Multiple deployer task runtime issues for the `startRelease` API command might occur. (CEV-12436)
- A `NonUniqueResultException` might occur when multiple runs of an application process against the same environment are launched simultaneously. (CEV-12403)
- `evalDsl` fails to modify `deployerApplication` if an `applicationProjectName` value is present. (CEV-12399)
- The “rolling deploy” status icon in the Release Environment configuration appears even after the rolling deploy option is turned off at the environment level. (CEV-12167)
- Stage inclusion status in the Release Dashboard changes color after a stage is renamed. (CEV-12429)
- Installing or upgrading remote agents:
 - For upgrades of remote agents, a resource name containing a space is split into two resources. (NMB-24276)
 - (Windows platforms) If an error occurs during agent installation using `PSEXEC`, the `PSEXEC` step is shown as successful even though it failed. (NMB-24284)
 - (Windows platforms) When installing remote agents, an agent cannot be installed in a domain when using the local user connection type and the domain user agent installation type. (NMB-24279)
- The first state of a workflow is not displayed after creation, and the second state appears incorrectly. (NMB-24245)
- Directory providers are destroyed after the built-in database configuration is changed to a MySQL configuration. (NMB-24237)

- The **Agent heartbeat spread** server setting does not function as intended and should not be enabled (although enabling it does not have major impact). The setting is disabled by default. (NMB-22849)
- When an application with snapshots created in ElectricFlow 6.1 or earlier is cloned and a project containing this application is imported to ElectricFlow 6.3, the import operation fails. (CEV-11106)
- An application deployment job hangs when a process step name is a number (for example, 1 or 2) or contains a slash (/ or \). (CEV-10238)

The workaround is to change the process step name to be non-numeric and to not have a slash (/ or \).

- If the user email address is changed in the Active Directory server or the LDAP server for an existing external user, email notifications continue to use the old user email address. (NMB-24052)

The workaround is to delete the entry for the remote user in ElectricFlow. The next time the user entry is retrieved from the directory server (for example, upon user login), the external user record will get created in ElectricFlow with the updated email address.

- Before importing an export file, you must change the plugin name, including the plugin version, in the file.
- Change tracking:

IMPORTANT: It can take a while to restart the ElectricFlow server while new records are created for all tracked objects. This might take at least as long as an export or import of all projects (a large project can take 10 to 40 minutes).

- You can revert changes only for high-level design objects such as applications, procedures, procedure steps, workflow definitions, and state definitions.
- When you disable change tracking and then re-enable it, system performance might be reduced when:
 1. Change tracking is disabled at the server level.
 2. Change tracking is re-enabled at the server level. The change history for all objects, including those not in projects, is now tracked.
- Pages in the ElectricFlow UI might render slowly if the application or environment has too many tiers.

Performance and Scalability Issues

- Enabling **Recursively Traverse Group Hierarchy** might impact the system performance when traversing the LDAP group hierarchy, depending on the system configurations of the ElectricFlow servers, the LDAP server, the depth of group hierarchy in the LDAP server, and the network latency between the servers. Make sure that your directory provider can handle the additional load for supporting nested group hierarchy traversal.

The following response times were recorded during Electric Cloud performance tests with nested LDAP groups support.

- Test Environment Details
 - ElectricFlow server:
CPU: Intel® Core™ i5-3210M CPU @ 2.50GHz

RAM: size: 3011MiB

Disk: product: VBOX HARDDISK

Size: 80 GiB (85 GB)

- Active Directory server:

CPU: Intel Core i5-3210M CPU @ 2.50GHz

RAM: size: 2 GB

Operating System: Windows Server 2012 R2

- Performance data set used:

Number of users: 5040

Number of groups: 126

Average number of users per group: 40

Average number of immediate groups per parent group: 2

Maximum depth of group hierarchy: 6

- Response times with Active Directory

Average of 1000 API calls with user and group at the fifth nested level in the Active Directory group hierarchy.

| API | ElectricFlow version 6.5 without recursive group hierarchy traversal | ElectricFlow version 6.5 with recursive group hierarchy traversal |
|----------|--|---|
| login | 1.066 seconds | 1.195 seconds |
| getUser | 1.086 seconds | 1.213 seconds |
| getGroup | 0.918 seconds | 1.102 seconds |

- Response times with OpenLDAP

Average of 1000 API calls with user and group at 5th nested level in the Active Directory group hierarchy.

| API | ElectricFlow version 6.5 without recursive group hierarchy traversal | ElectricFlow version 6.5 with recursive group hierarchy traversal |
|----------|--|---|
| login | 0.744 seconds | 0.753 seconds |
| getUser | 0.705 seconds | 0.714 seconds |
| getGroup | 0.657 seconds | 1.011 seconds |

- For hundreds of parallel job steps, Job Scheduler performance issues might occur at job startup. (NMB-16185)
- The time needed to add a property to a job increases as the number of properties increases. (NMB-16120)
- The time needed to add a step to a procedure increases as the number of steps increases. (NMB-16118)

Plugins That are Bundled with ElectricFlow

The following plugins are included in ElectricFlow.

| Name | Version |
|----------------------------|--------------|
| EC-AgentManagement | 1.2.0.111284 |
| EC-ALM | 1.0.8.111171 |
| EC-Ant | 2.0.9.111171 |
| EC-Artifact | 1.1.2.111171 |
| EC-CheckStyle | 2.0.5.111171 |
| EC-Chef | 1.2.0.24 |
| EC-CIManager | 1.4.0.111171 |
| EC-Clover-CMD | 2.0.3.111171 |
| EC-Cobertura | 2.0.6.111171 |
| EC-CodeScanner | 2.0.4.111171 |
| EC-Core | 1.2.5.111171 |
| EC-Coverity | 1.0.2.111171 |
| EC-CppCheck | 2.0.5.111171 |
| EC-CppNcss | 2.0.4.111171 |
| EC-CSH | 2.0.2.111171 |
| EC-DBI | 2.0.2.111171 |
| EC-DefectTracking | 1.1.7.111171 |
| EC-DefectTracking-ALM | 1.0.5.111171 |
| EC-DefectTracking-Bugzilla | 2.0.7.111171 |
| EC-DefectTracking-CQ | 2.0.5.111171 |

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|-----------------------------|--------------|
| EC-DefectTracking-Fortress | 2.0.7.111171 |
| EC-DefectTracking-JIRA | 2.1.3.111171 |
| EC-DefectTracking-MKS | 2.0.3.111171 |
| EC-DefectTracking-QC | 2.0.9.111171 |
| EC-DefectTracking-Rally | 2.0.5.111171 |
| EC-DefectTracking-RTC | 2.1.1.111171 |
| EC-DefectTracking-TeamForge | 2.0.7.111171 |
| EC-DefectTracking-TestTrack | 2.0.3.111171 |
| EC-DefectTracking-TFS | 2.0.7.111171 |
| EC-EC2 | 2.3.4.83 |
| EC-EMake | 1.0.6.111171 |
| EC-EMMA | 2.0.1.111171 |
| EC-ESX | 2.2.1.27 |
| EC-FileOps | 2.0.5.111244 |
| EC-FileSysRepo | 1.0.0.32 |
| EC-FindBugs | 2.0.4.111171 |
| EC-Flog | 2.0.3.111171 |
| EC-Groovy | 2.0.3.111171 |
| EC-Homepage | 1.4.0.111171 |
| EC-HPQualityCenter | 3.0.3.111171 |

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|----------------------|--------------|
| EC-IIS | 2.0.7.5 |
| EC-IIS7 | 2.0.7.11 |
| EC-Jasmine | 2.0.1.111171 |
| EC-JBoss | 2.1.4.111171 |
| EC-Jetty | 1.0.3.111171 |
| EC-JMeter | 2.0.4.111171 |
| EC-JTest | 2.0.4.111171 |
| EC-Klocwork | 2.0.3.111171 |
| EC-Klocwork-EA | 1.0.4.111171 |
| EC-KVM | 1.0.6.111171 |
| EC-LabManager | 2.2.3.111171 |
| EC-Make | 2.0.5.111171 |
| EC-Maven | 2.3.2.111171 |
| EC-MSBuild | 2.0.5.111171 |
| EC-MSSystemCenterVMM | 2.0.2.111171 |
| EC-MSTest | 1.0.4.111171 |
| EC-MYSQL | 2.0.8.111171 |
| EC-NAnt | 2.0.4.111171 |
| EC-NCover | 2.0.2.111171 |
| EC-NMake | 2.0.3.111171 |
| EC-NMakeATT | 1.0.7.111171 |
| EC-OpenStack | 1.3.3.212 |
| EC-Oracle | 2.0.5.111171 |

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|------------------|--------------|
| EC-Pclint | 2.0.4.111171 |
| EC-PHP | 2.0.4.111171 |
| EC-PluginManager | 1.4.0.111171 |
| EC-PMD | 2.0.4.111171 |
| EC-Powershell | 2.0.4.111171 |
| EC-PureCoverage | 1.0.5.111171 |
| EC-Purify | 2.0.4.111171 |
| EC-Python | 2.0.6.111171 |
| EC-QTP | 2.0.7.111171 |
| EC-Quantify | 1.0.6.111171 |
| EC-Rake | 2.0.3.111171 |
| EC-Rcov | 2.0.4.111171 |
| EC-ReportEngine | 1.0.0.111171 |
| EC-Reports | 2.1.0.111171 |
| EC-Ruby | 2.0.6.111171 |
| EC-Security | 1.2.1.111171 |
| EC-Selenium | 2.0.5.111171 |
| EC-SendEmail | 1.0.1.111171 |
| EC-SilkCentral | 1.0.5.111171 |
| EC-SilkTest | 1.0.7.111171 |
| EC-Sonar | 2.0.4.111171 |
| EC-Splint | 2.0.3.111171 |
| EC-SQLServer | 2.0.7.111171 |
| EC-Tclsh | 2.0.3.111171 |

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|-------------------|---------------|
| EC-TCSH | 2.0.3.111171 |
| EC-TestNG | 2.0.4.111171 |
| EC-Tomcat | 2.1.1.111171 |
| EC-Tutorials | 1.0.0.111171 |
| EC-Twitter | 1.0.1.111171 |
| EC-vCloudDirector | 1.4.6.111171 |
| EC-VirtualBox | 1.0.4.111171 |
| EC-VisualStudio | 2.0.3.111171 |
| EC-WebLogic | 3.2.2.41 |
| EC-WebSphere | 2.2.1.86 |
| ECSCM | 2.2.11.111171 |
| ECSCM-Accurev | 2.0.2.111171 |
| ECSCM-Bazaar | 2.0.2.111171 |
| ECSCM-ClearCase | 2.0.2.111171 |
| ECSCM-CVS | 2.0.6.111171 |
| ECSCM-File | 2.0.3.111171 |
| ECSCM-Git | 3.7.3.19 |
| ECSCM-Mercurial | 2.0.5.111171 |
| ECSCM-MKS | 2.2.1.4 |
| ECSCM-Perforce | 2.8.5.111171 |
| ECSCM-Property | 2.0.1.111171 |
| ECSCM-Repo | 2.2.0.93709 |
| ECSCM-StarTeam | 2.0.2.111171 |
| ECSCM-SVN | 3.3.1.111171 |

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|--------------|--------------|
| ECSCM-TFS | 2.3.4.111171 |
| ECSCM-Vault | 2.0.1.111171 |
| EF-Utilities | 1.0.7.37 |

Documentation

ElectricFlow documentation is available at http://docs.electric-cloud.com/eflow_doc/FlowIndex.html. This documentation is updated periodically post-release.

ElectricFlow has the following product documentation:

- *ElectricFlow User Guide*
- *ElectricFlow Installation Guide*
- *ElectricFlow API Guide*
- A complete, robust online help system. Click any Help link in the upper-right corner of each web page in the Automation Platform UI.
- *ElectricFlow Release Notes*
- Additional ElectricFlow documentation that accompanies the ElectricFlow release, but not necessarily updated with each ElectricFlow release:
 - *Plugin Developers Guide*, which is used with the ElectricFlow SDK, is updated on its own release cycle.
 - *ElectricFlow Plugin Developer Release Notes*