ElectricFlow 5.4

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ElectricFlow Overview

ElectricFlow™ accelerates the continuous delivery of software. It provides domain-specific capabilities to orchestrate build, test, deploy, and release processes across many delivery pipelines. ElectricFlow includes ElectricCommander, a powerful platform that natively integrates these domain-specific capabilities to provide Enterprise-level continuous delivery. ElectricFlow makes software delivery processes repeatable, visible, scalable, and efficient.

ElectricCommander® is a powerful automation platform that provides distributed DevOps teams shared control and visibility into infrastructure, tool chains, and processes. ElectricCommander accelerates and automates the software delivery process and enables agility, availability, predictability, and security across many build-test-deploy pipelines.

The following diagram shows how ElectricFlow provides continuous delivery.

- ElectricFlow provides management and visibility of the build, test, deploy, and release phases.
  It provides tracking and pipelines for continuous delivery using deployment application processes.
- ElectricFlow is built on the proven ElectricCommander platform, which automates the software build and release process using procedures.
- ElectricAccelerator performs the build and test phases of the continuous delivery process using procedures.

Concepts

The following diagram shows the relationships between the objects in ElectricFlow.
This is a typical sequence of steps to model and deploy an application in ElectricFlow:

1. Create the application and application tiers.
2. Create components and component processes.
3. Create application processes.
4. Create resources.
5. Create environments and environment tiers, and assign resources to the tiers.
6. Map application tiers to environment tiers.
7. Deploy (run) the application.

**Terminology**

In ElectricFlow, you model and deploy applications to automate tasks and to orchestrate processes in the build, test, deploy, and release phases of your application life cycle.

ElectricFlow has these objects and concepts:

- **Application**—Application can refer to one of these entities:
  - Within ElectricFlow, you model and deploy (run) an application to build, test, deploy, and release your software for continuous delivery across different pipelines. An application consists of application tiers, components in these tiers, component processes, and application processes.
  - Before running an application in ElectricFlow, you must map its application tiers to
corresponding environment tiers where the application will run.

- Outside of ElectricFlow, application refers to the software or application that you want to deploy, where the deployment includes build, test, installation, implementation, deploy, and release processes.
  This is the end product of using ElectricFlow.

- **Application Inventory**—Where ElectricFlow shows the status of an application as it runs and the results of previous runs. It includes when the application ran, how long it took, whether the application ran successfully or not, error messages, and links to more information for troubleshooting.

- **Application process**—A group of steps, actions, or component processes taken when the ElectricFlow application is deployed. You can re-use and rerun the process more than once.

- **Application tier**—A logical grouping of components in an ElectricFlow application, which must have one or more tiers with components. A tier can have one or more components.

- **Automation platform**—A software application that automatically runs tasks and procedures and manages the objects in them. ElectricFlow, a continuous delivery solution, is built on the ElectricCommander automation platform.

- **Change history**—A record of the historical states of the system and the changes between them over time.

- **Change Tracking**—How ElectricFlow monitors the changes to tracked objects, including applications, procedures, workflows, workspaces, resources, and project-owned components (such as libraries), and how it records a change history.

- **Component**—An object based on a specific version of an artifact that is defined in an application. Artifacts are defined and managed in the ElectricCommander automation platform.
  A component is the result of running an ElectricFlow application and has details, properties, and access control settings.
  It can be used by other ElectricFlow applications, or it can be the part of the continuous delivery solution.
  You add a component to an application tier.

- **Component process**—A group of steps or actions taken on a component when the ElectricFlow application is deployed. You can re-use and rerun these processes more than once.

- **Deploy**—Deploy can refer to one of these activities:
  
  - **Within ElectricFlow**—Running the application that you modeled in ElectricFlow. The result is your software, application, or system, such as a WAR file, database, or configuration.
    
    You model an application and an environment, define component and application processes, map application tiers to environment tiers, and run the application in the environment.

    **Note**: Within ElectricFlow, the terms deploy and run are synonymous. When deploying an application in ElectricFlow, you are actually running it to produce your software or application.

  - **Outside of ElectricFlow**—Running all the processes, procedures, or actions to develop and deploy your software in the appropriate environment, where the deployment includes build, test, installation, implementation, deploy, and release phases.
• **Deploying (running) applications**

You can deploy applications one of these ways:

- Full deploy–The system deploys all the objects (including application processes, components, and artifacts) in the application.
- Smart deploy–The system deploys only the artifacts that have not been deployed to a resource or specific versions of the artifacts or have not been deployed to new resources.
- Partial deploy–The system deploys only objects that you select.
- Partial deploy with specific artifact versions–The system deploys only the artifacts with selected versions.
- Schedule–Create schedules to run applications on a one-time, daily, weekly, or monthly basis.
- Snapshot–Select a snapshot to deploy.

• **Dynamic environment**–An environment that is automatically created on an on-demand basis, when you deploy an application in ElectricFlow.

A dynamic environment is an environment that is provisioned using an environment template. You can add provisioned cloud resources as well as static resources to an environment template. All of the following are considered to be dynamic environments:

- An environment with only provisioned cloud resources
- An environment with only static resources added to an environment template
- An environment with provisioned cloud resources and static resources.

The provisioned cloud resources are spun up when you are ready to deploy the application. The static resources that are part of your system or network (such as servers, databases, and agent machines).

• **Dynamic resource pools**–Resource pools that are created by provisioning a resource or environment template in ElectricFlow or in the ElectricCommander automation platform.

• **Dynamic resources**–Resources in the cloud that you can provision and later spin up when the application is deployed. You can also group these resources into dynamic cloud resource pools. You can define these resources in resource templates.

• **Environment**–Within the ElectricFlow system, the location to which a resource is assigned and where the application runs. See also *dynamic environment* and *static environment*.

Before running an application in ElectricFlow, you must map its application tiers to corresponding environment tiers where the application will run.

• **Environment Inventory**–How ElectricFlow represents the status of an application as it runs in a specific environment at any point in time during the life cycle of your software. It tracks the application processes as they run and the results of previous runs, when the application ran, how long it took, the versions of the deployed software artifacts, the resources used, error messages, and links to more information for troubleshooting.

• **Environment template**–A template defining an environment that can be spun up when the application is deployed. The template details include the environment name, its description, the environment tiers, and the resources assigned to the environment tiers. You can add one or more static resources to an environment tier. When adding resource templates to a tier, you can add only one resource template and then enter the number of dynamic resources to provision.
• **Environment tier**—A logical grouping of resources in an ElectricFlow environment, which must have one or more tiers with resources. A tier can have more than one resource.

• **Inventory Tracking**—How ElectricFlow tracks what is deployed for continuous delivery.

  ElectricFlow tracks this information at the application and environment levels. The environment inventory is more comprehensive than the application inventory. For more information, see the application inventory and environment inventory.

• **Launch pad**—A starting point on the Home page from which you can go to the Applications List, Environment List, or ElectricCommander automation platform to model the ElectricFlow application. You deploy this application to build, test, deploy, and release your software for continuous delivery.

• **Plugin**—An add-on program used by ElectricFlow to integrate with third-party tools, custom dashboards, and unique user experiences based on roles. The ElectricCommander automation platform has an extensible architecture, and you can easily develop plugins with other tools and applications. Many plugins are automatically installed during the ElectricFlow installation, which makes them transparent to the user.

• **Process branching**—How to run job steps in an application or component process on a conditional basis in ElectricFlow.

• **Process type**—Select one of the following parameters to configure how Inventory Tracking works on an application or component process in ElectricFlow:
  
  † **Deploy**—Select this to enable Inventory Tracking. The ElectricCommander server tracks artifacts deployed to environments. This is the default.

  † **Undeploy**—Select this to configure the ElectricCommander automation platform to remove the environment inventory record after the first job step in a component process runs successfully.

  † **Other**—Select this to disable Inventory Tracking.

• **Resource**—An agent machine configured to communicate with the ElectricCommander automation platform. The application runs on the resource. The ElectricCommander automation platform defines and manages resources. See also *dynamic resource* and *static resource*.

• **Resource template**—A template with the required information to provision and later spin up cloud resources on an on-demand basis. You set the cloud provider and configuration management details in a resource template. In an environment template, you define environment tiers and can assign resource templates to the environment tiers. You can add, edit, or remove resource templates.

• **Run**—Run can refer to these activities:
  
  † Within ElectricFlow—Deploying the application that you modeled in ElectricFlow. The result is your software, application, or system, such as a WAR file, database, or configuration.

    You model an application and an environment, define component and application processes, map application tiers to environment tiers, and run the application in the environment.

    **Note**: Within ElectricFlow, the terms *deploy* and *run* are synonymous. When deploying an application in ElectricFlow, you are actually running it to produce your software or application.

  † Outside of ElectricFlow—Deploying all the processes, procedures, or actions to develop and deploy your software in the appropriate environment, where the deployment includes build, test, installation, implementation, deploy, and release phases.
• **Snapshot**—A version of an application with specific artifact versions and the state of the application at any point in time.

• **Static environment**—An environment with resources that are in your system or network, such as servers, databases, and agent machines. You model this environment and assign static resources to it before deploying the application.

• **Static resource**—A resource located in your system or network, not in the cloud. Servers, databases, and agent machines are examples of static resources.

• **Tier map**—The mapping of the application tiers to the corresponding environment tiers where the application will run. To run an application, you map one application tier to one or more environment tiers and must have at least tier map.

**ElectricFlow Features**

To automate your deployments for continuous delivery, you model and deploy (run) applications in ElectricFlow.

• **Applications** consist of application processes and application tiers.
  
  You add components to application tiers and model component processes.
  
  Components are based on artifacts that are defined and managed by the ElectricCommander automation platform.
  
  • Before deploying an application, you map an application process to an environment, where the application will be deployed, in a *tier map*.
    
    A tier map can have one or more mappings of an application tier to an environment tier.
    
    An environment tier can be mapped to more than one application tier.

• **Environments** can be static or dynamic.
  
  You can create a *static environment* before deploying an application, or you can create a *dynamic environment* when deploying the application.
  
  An environment consists of one or more environment tiers to which resources are added.
  
  In a static environment, you can add only static resources to the environment tiers. These resources are defined and managed in the ElectricCommander automation platform.
  
  You can create dynamic environments with provisioned cloud resources and static resources in ElectricFlow 5.4 or later.

Apply these features in your application:

• **Dynamic environments**
  
  A dynamic environment is automatically spun up on an on-demand basis when you deploy an application. It can have provisioned cloud resources and static resources.
  
  Dynamic environments allow you to optimize how your cloud resources are used, re-use provisioned resource pools, track the status and usage of cloud resources, and verify the credentials of these resources before provisioning them.
• Deploying applications

You can deploy part or all of the objects one of these ways:

- Full deploy—All objects in the application are deployed.
- Smart deploy—Only objects that have not been deployed to specific resources, not deployed with specific artifact versions, or on new resources
- Partial deploy—Only specific objects and versions
- Schedule—On a one-time, daily, weekly, or monthly basis.
- Snapshot—Based on a version of the application with specific artifact versions and the state of the application at any point in time.

While developing an application, you can save different versions of the application as snapshots and compare them to refine and troubleshoot the application.

• Change Tracking

ElectricFlow monitors changes to tracked objects, such as applications, procedures, workflows, workspaces, resources, and project-owned components (such as libraries). It records a change history of the historical states of the system and the state changes.

• Snapshots

You can design and save a version of your application with specific artifact versions. If you save snapshots of the application during development and test phases, you can ensure that the components that were developed and tested are the same as those in the released version of the application. You can redeploy the snapshot any time.

• Credentials and impersonation

You apply credentials and impersonation to control who can run applications and where the applications are run.

- You can attach one or more credentials to component or application process steps.
- You can attach only one impersonation credential to an application process, component process, or a process step.
- When you attach an impersonation credential in ElectricFlow, it specifies the user who can deploy the application and the environment in which the application is deployed.
- When you attach an impersonation credential in the ElectricCommander automation platform, it specifies the account (user) that can run the job or job step. If you want to specify another condition, you have to attach another credential to the object.

• Custom parameters in application processes

You can define and apply custom parameters to application processes in your deployments.

You define the parameters and apply them while deploying the application or while defining an application process step, which determines when and how the application is deployed.
Email notifications

You can easily customize the email notification that the system sends when an application, application process, or process step runs.

When setting the recipients of email notifications, you can specify users or groups, which are defined and managed in the ElectricCommander automation platform, as well as email addresses.

Tracking, viewing, and troubleshooting the deployment results

Use the Environment Inventory to track and view details of the objects that were deployed and artifacts in the application. It shows the status of the application deployment at a point in time.

Use the Application Inventory to track and view the deployment results. It shows more details about the application at a point in time.

You can also view the change history of the objects in the application and search for specific information.

More about application, deploy, and run:

As you use ElectricFlow, remember that these terms have different meanings within ElectricFlow and outside of ElectricFlow when you deploy your software or application:

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<td>Application</td>
<td>The application that you design and run (deploy) to produce your software for continuous delivery across different pipelines.</td>
<td>The software, system or application that you build, test, install, implement, release, and deploy using ElectricFlow. This is the end product of using ElectricFlow.</td>
</tr>
<tr>
<td>Deploy</td>
<td>Running the application that you designed in ElectricFlow. The end product is your software, system, or application. Deploy is a synonym of run in ElectricFlow.</td>
<td>All the processes or actions to develop and run your software in its environment, including building, testing, implementing, installing, configuring, making changes, and releasing.</td>
</tr>
<tr>
<td>Run</td>
<td>Running the application that you designed. The end product is your software, system, or application. <em>Run</em> is a synonym of <em>deploy</em> in ElectricFlow.</td>
<td>All the processes or actions to use software in its environment, including implementing, installing, configuring, debugging, troubleshooting, and releasing.</td>
</tr>
</tbody>
</table>

What You Can Do With ElectricFlow

You can model your continuous delivery process to reliably and repeatedly deploy (build, test, implement, and release) your software. The process model connects applications to environments in ElectricFlow. It provides the logical structure on which you model and deploy (run) an application and has these benefits:
Repeatability—You can run the process many times and get consistent and reliable results each time.

Flexibility—You can model and deploy one process with different requirements and inputs, running conditions, and types of output. You can also easily revise your application to quickly respond the changes in the software and its environment.

Ability to deploy your software more than once—You can deploy your process many times, knowing that it will run properly for various inputs, conditions, and output types.

One Application for Multiple Use Cases

In ElectricFlow, you can model an application that works for more than one deployment scenario. For example, you can deploy software releases for Linux, Javascript, and Windows using the same application. You can also specify who can run specific processes in the application and the environment in which the processes are run without modeling and running applications for each scenario.

When modeling the application and the environments in which it runs, you can implement the following:

- Process branching
  
  Model an application or component process with more than one path. Decisions about the next step are made while the process runs.

  ElectricFlow uses conditions (success, failure, or custom) to determine the path through the application or component process.

- Credentials and impersonation
  
  You can control who runs an application or component process step and where that step runs (the environment) using credentials.

  You can also attach an impersonation credential to an application process, a component process, or a process step to give a user higher order privileges for the only that part of the process or process step.

Keeping Users Up-To-Date

You can set email notifications, which are sent to users or groups who are interested in or need to know the results. Notifications are sent when the application, application process, or process step succeeds or fails. You can select recipients by specifying the user name, which is defined and managed in the ElectricCommander automation platform, or the user's email address. It is easy to customize the text for the email notification in the ElectricFlow UI.

Keeping Track of Changes

Starting in ElectricFlow 5.3, Change Tracking is available for more reliable and repeatable software deployments. ElectricFlow tracks changes to tracked objects including applications, artifacts, components, application and component process steps, jobs, resources, and workflows. It records a change history of the historical states of the system and the state changes.

You can use Change Tracking in these scenarios:

- When you are debugging a failed job or want to more information about a component, see the change history for the changes relevant to that object.

- When you search for specific change history records, filter the records by time frame, change type, entity type, or developer.

- Revert changes to an object or to an objects and its children.

- When you want to determine the differences between objects, export them at various levels in the object hierarchy.
Taking Snapshots

Starting in ElectricFlow 5.3, snapshots are available for more reliable and repeatable software deployments.

- You can model and save a version of your application with specific artifact versions and rerun it later, even if the latest version of the application changed.
- If you save snapshots of the application during development and test phases, you can ensure that the components that were developed and tested are the same as those in the released version of the application. You can redeploy the snapshot any time.
- You can create and save more than one snapshot for different deployment scenarios.
- You can view the snapshots in the Snapshot List. From this list, you can manage all your snapshots, compare two snapshots, or get more information about them.
- Comparing snapshots helps you to deploy applications with reliable and repeatable results during ongoing cycles of software releases. You can build and test applications using snapshots, and do not have to design a new application for each release.
- You can use snapshots to refine and optimize an application that fits your deployment scenario and ensure that this version is properly developed, tested, and released.

Optimizing How Resources are Used

Starting in ElectricFlow 5.4, you can model and create *dynamic environments* that are automatically spun up when an application is deployed. These environments can have cloud and static resources.

You provision cloud resources by using resource templates. When you are ready to deploy the application, use environment templates to dynamically create the environment.

Using dynamic environments allows you to do the following:

- Provide ways to optimize how cloud resources are used.
- Re-use provisioned resource pools.
- Track how provisioned cloud resources are used.
- Provide the status of the provisioning process.
- Verify the credentials of cloud resources before provisioning them.
- Configure the middleware of cloud resources on an on-demand basis.

Customizing Deployments

During the development, testing, and implementation of your application, you can deploy the application several ways, depending on what you want to do and where you are in the continuous delivery cycle.

- Full deploy—Deploy all of the artifacts in the application.
- Partial deploy—Deploy some of the artifacts by specifying the objects of the application to deploy or by specifying the artifact versions of the objects.
- Smart deploy—Deploy only the artifacts that have not been deployed to a resource, specific versions of artifacts, or artifacts that have not been yet deployed to new resources.
- Based on a schedule—Deploy the application a one-time, daily, weekly, or monthly basis.
- Snapshot—Select a snapshot to deploy.
• Based on custom parameters defined in application processes—Set these parameters when you deploy the application or when you define an application process step. They determine how the application should be deployed.

Getting the Real-Time Status of Application Runs and Troubleshooting

Go to the Application Inventory and the Environment Inventory to view the progress of the application as it runs and the results of previous runs. They show detailed results that can be used to troubleshoot the application.

• In the Application Inventory, you can get information about the application, its application processes, components, and job steps and about the status of these objects.

• In the Environment Inventory, you can get more details about the environment, the applications mapped to it, number of deployed artifacts in the applications, where the artifacts are deployed, and the status of these objects.

You can also create and compare snapshots.

Credentials and Impersonation in ElectricFlow

ElectricFlow uses credentials and impersonation to control who can deploy applications and where the applications are deployed (environment). The user settings and credentials are defined and managed in the ElectricCommander automation platform.

When modeling an application, you can attach one or more credentials to component or application process steps. However, you can attach only one impersonation credential to these objects:

• Component process
• Component process step
• Application process
• Application process step

When you deploy (run) the application, the system applies credentials and impersonation based on the ElectricFlow user permissions and deploys the application in one or more environments.

Example

This example describes how you can attach impersonation credentials to an application in ElectricFlow. An application has these credentials:

• Development (dev)
• Quality Engineering (qe)
• Production (prod)

Users have these privileges:

• User A is allowed to deploy the application to build a MySQL database in any environment and has admin privileges.
• User B is allowed to only deploy the application in the development and "quality engineering" environments and is not trusted in the production environment.

The following user permissions determine what users are allowed to do in ElectricFlow.
When you configure User A's profile in the ElectricCommander automation platform and give User A higher-order privileges than other users, User A has the following credentials, including impersonation:

For each environment in ElectricFlow, set a property using a reference such as $[myEnvironment/dbConfigName] and define a unique value, which can be passed as a credential to a process or process step.

- In the development (dev) environment, set `dbConfigName = dbUser_dev`.
- In the quality engineering (qe) environment, set `dbConfigName = dbUser_qe`.
- In the production (prod) environment, set `dbConfigName = dbUser_prod`.

When you configure User B's profile in the ElectricCommander automation platform, User B is only given the credentials to deploy in the production environment. You do not need to set properties to be passed as credentials when the application is deployed.

You cannot configure these credentials and impersonation settings for User A and User B only using the ElectricCommander automation platform. To use impersonation in the ElectricCommander platform, the credentials are more complicated. You need to create three unique credentials for the environments in addition to credentials for the various user and environment combinations, such as User A and the development environment.

**Email Notifications in ElectricFlow**

ElectricFlow uses email notifications at the application, application process, and process step levels (application and component). The user settings are defined and managed in the ElectricCommander automation platform.

In ElectricFlow, email notifications work as follows:

- The notifications are triggered based on how the job finishes (the onCompletion event) and on the success or failure of the job.
- You set email notifications at the application, application process, and process step levels.
- You specify users, groups, or email addresses as recipients of the notifications.
- You can also target notifications at specific environments.
- You can enable or disable notifications at the application, application process, or process step level.

ElectricFlow provides two default templates for success and failure. You can also create new email templates to meet your needs. The templates have a name, subject, body, and type content that are stored as properties in ElectricFlow.

**Deploying Applications in ElectricFlow**

How you deploy applications in ElectricFlow depends on what you want to deploy:

- Full deploy—ElectricFlow deploys all the objects (including application processes, components, and artifacts) in the application. When you deploy an application for the first time, you must do a full deploy. Later, you can use this method to verify that the software is ready to be released.
- Smart deploy—The system deploys only the artifacts that have not been deployed to a resource, specific versions of the artifacts, or artifacts that have not yet been deployed to new resources. You can use this method during the development and test phases to verify artifact or resource updates.
- Partial deploy—The system deploys only objects that you select. You can use this method during the development and test phases to verify incremental changes.
• Partial deploy with specific artifact versions—The system deploys only the artifacts with selected versions. You can use this method during the development and test phases to verify incremental changes.

• Schedule—You can create schedules to deploy applications on a one-time, daily, weekly, or monthly basis. You can schedule nightly builds so that the developers always have a new version to continue their work on every day.

• Snapshot—You select a snapshot to deploy. A snapshot is an immutable version of the application with specific artifact versions. When you save snapshots during the build, test, deploy, and release phases, you can compare them to optimize and troubleshoot the application in ElectricFlow.

  **Note:** If you select a snapshot and modify it, it is no longer a snapshot and becomes a different version of the of application, which you can save as a new snapshot.

• Based on custom parameters defined in application processes—Set these parameters when you deploy the application or when you define an application process step. They determine how the application should be deployed.

You can run applications by combining methods, such as smart deploy and a partial deploy with specific artifact versions, full deploy with a snapshot, or only smart deploy. This sequence is an example of how you may deploy your software over time.

• When you create an application in ElectricFlow and deploy it for the first time, you must do a full deploy. By default, smart deploy is disabled the first time that you run an application.

• Throughout these deployments, you can schedule the deployments to occur on a daily or weekly basis to provide builds that can be tested and installed on a regular basis.

• You can also save snapshots of the software at regular intervals or milestones. When you need to troubleshoot the software or want to do performance testing, you can use one of these snapshots for comparison.

• If the application does not deploy successfully, you can redeploy parts of it to troubleshoot the application or component processes that failed.

  You can do a partial deploy and redeploy the application with only the objects that failed.

  You can also do a partial deploy only with specific versions of artifacts to determine if one or more specific versions of artifacts are causing problems.

• Later, after successfully deploying the application, you can redeploy parts of the application when new versions of artifacts or new resources are available.

• When a new version of an artifact is released, you can deploy only the artifact by selecting the new version and doing a partial deploy.

• When you add artifacts and resources to the application, you deploy the new artifacts to resources and specific versions of selected artifacts to the new resources, a combination of smart deploy and partial deploy with specific artifact versions.

**Local ElectricFlow System**

In this local configuration:

• The ElectricCommander server manages resources, issues commands, and generates reports.

• Applications, components, environments, and job steps are defined in ElectricFlow.
- Job steps are executed on resources in the defined environments.
- An underlying database stores commands, metadata, and log files.

If you are only evaluating ElectricFlow, the ElectricFlow software, the database, the ElectricCommander server, the web server, and the repository server can reside on the same machine.

In a production environment, the database should reside on a separate machine from the ElectricCommander server to prevent performance issues. It is acceptable for the Commander server, web server, and repository server to reside on the same machine in a local configuration, but not required.
ElectricFlow User Interfaces

The following topics describe how to use the ElectricFlow buttons and user interfaces (UIs) to model and deploy (run) applications in ElectricFlow.

More about application, deploy, and run:

As you use ElectricFlow, remember that these terms have different meanings within ElectricFlow and outside of ElectricFlow when you deploy your software or application:

<table>
<thead>
<tr>
<th>Term</th>
<th>Within ElectricFlow</th>
<th>Outside of ElectricFlow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>The application that you design and run (deploy) to produce your software for continuous delivery across different pipelines.</td>
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<td></td>
<td>This is the end product of using ElectricFlow.</td>
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<tr>
<td>Deploy</td>
<td>Running the application that you designed in ElectricFlow.</td>
<td>All the processes or actions to develop and run your software in its environment, including building, testing, implementing, installing, configuring, making changes, and releasing.</td>
</tr>
<tr>
<td></td>
<td>The end product is your software, system, or application. Deploy is a synonym of run in ElectricFlow.</td>
<td></td>
</tr>
<tr>
<td>Run</td>
<td>Running the application that you designed.</td>
<td>All the processes or actions to use software in its environment, including implementing, installing, configuring, debugging, troubleshooting, and releasing.</td>
</tr>
<tr>
<td></td>
<td>The end product is your software, system, or application.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Run</em> is a synonym of <em>deploy</em> in ElectricFlow.</td>
<td></td>
</tr>
</tbody>
</table>

ElectricFlow Buttons and Icons

These buttons and icons appear in the ElectricFlow user interface (UI).

For more information about how they work in the UI, see the ElectricFlow UI topics.
<table>
<thead>
<tr>
<th>Button or Icon</th>
<th>Name</th>
<th>Tooltip (Hover over the button to view the tooltip.)</th>
<th>How to Use It</th>
</tr>
</thead>
</table>
| ![Add icon](image) | Add    | Depends on where it is in the user interface. | Click this button to add an object. It appears in many places in the ElectricFlow UI. **Examples:**  
It appears in lower right corner of an application tier. Click it to add a component to the application tier.  
It also appears in a new resource in an environment tier. Click it to define the resource. |
| ![Add + icon](image) | Add +  | Depends on where it is in the user interface.  
In the Applications List: Add new application  
In the Environments List: Add new environment | Click this button to add an application or environment to the Applications List or the Environments List. |
| ![Add process icon](image) | Add process | Depends on where it is in the user interface.  
In the Applications List: Add application process  
In a component: Add component process | Click this button to add an application or component process. |
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Add Step" /></td>
<td>Add step</td>
<td>Add step</td>
<td>Click this to add a step to an application or component process.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>When you click it, an undefined step appears. Drag and drop the step to</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>where you want to add it in the process.</td>
</tr>
<tr>
<td><img src="image" alt="Add Tier" /></td>
<td>Add tier</td>
<td>Add tier</td>
<td>Click this button to add a tier in the Applications Visual Editor or the</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Environments Visual Editor.</td>
</tr>
<tr>
<td><img src="image" alt="Add Tier Map" /></td>
<td>Add tier map</td>
<td>Add tier map</td>
<td>Click this button to add a tier map.</td>
</tr>
<tr>
<td><img src="image" alt="Application" /></td>
<td>Application</td>
<td>–</td>
<td>When you see this icon in the ElectricFlow UI, the object is an application.</td>
</tr>
<tr>
<td><img src="image" alt="Applications" /></td>
<td>Applications</td>
<td>–</td>
<td>Click this launch pad to go to the Applications List.</td>
</tr>
<tr>
<td><img src="image" alt="Artifact Version" /></td>
<td>Artifact version</td>
<td>–</td>
<td>This appears in the Environment Inventory.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The number next to the icon is the artifact version number.</td>
</tr>
<tr>
<td>Button or Icon</td>
<td>Name</td>
<td>Tooltip (Hover over the button to view the tooltip.)</td>
<td>How to Use It</td>
</tr>
<tr>
<td>---------------</td>
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<td>-------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td><img src="image" alt="Automations" /></td>
<td>Automations</td>
<td>–</td>
<td>Click this launch pad to go to the ElectricCommander automation platform for more details about objects.</td>
</tr>
<tr>
<td><img src="image" alt="Available" /></td>
<td>Available</td>
<td>–</td>
<td>When you see this button in the ElectricFlow UI, the environment is available. You can deploy an application in this environment. When you click this button, the environment becomes unavailable, and you cannot use this environment to deploy an application.</td>
</tr>
<tr>
<td><img src="image" alt="Breadcrumb" /></td>
<td>Breadcrumb</td>
<td>–</td>
<td>Breadcrumbs show the path to where you are in the ElectricFlow UI in this format: <code>object type/object name/...</code>. In this example, the breadcrumb goes to a component called <code>hc-warfile</code> and is in this format: <code>Applications/&lt;application name&gt;/&lt;component name&gt;</code>.</td>
</tr>
<tr>
<td><img src="image" alt="Change Alert" /></td>
<td>Change Alert</td>
<td>–</td>
<td>When you compare snapshots, this icon appears next to objects that have changed.</td>
</tr>
<tr>
<td>Button or Icon</td>
<td>Name</td>
<td>Tooltip (Hover over the button to view the tooltip.)</td>
<td>How to Use It</td>
</tr>
<tr>
<td>----------------</td>
<td>------</td>
<td>-------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Changes</td>
<td>Changes</td>
<td>The tooltip message varies depending on the object that changed. For example, the tooltip can be &quot;Component property has changed&quot; or &quot;Artifact version has changed.&quot;</td>
<td></td>
</tr>
<tr>
<td>Compare snapshots</td>
<td>Compare snapshots from a list</td>
<td>This is available (enabled) when the Snapshot List has two or more snapshots. Click this to open a full-screen window and view two snapshots next to each other. The default is to have the most recent snapshot on the left and the previous snapshot on the right. Go to Snapshot List on page 87 for more information.</td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>–</td>
<td>When you see this icon in the ElectricFlow UI, the object is a component.</td>
<td></td>
</tr>
<tr>
<td>Copy</td>
<td></td>
<td>Click this button to copy the information about an object. You can paste it in a text field or area.</td>
<td></td>
</tr>
<tr>
<td>Delete</td>
<td>Delete</td>
<td>Click this button to delete the selected objects. The button is enabled when the objects have been selected.</td>
<td></td>
</tr>
<tr>
<td>Button or Icon</td>
<td>Name</td>
<td>Tooltip (Hover over the button to view the tooltip.)</td>
<td>How to Use It</td>
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</tr>
<tr>
<td>![Edit Icon]</td>
<td>Edit</td>
<td>Edit</td>
<td>Click this button to edit the name and description of the object.</td>
</tr>
<tr>
<td>![Email Notifications Icon]</td>
<td>Email notifications</td>
<td>Email notifications</td>
<td>Click this to configure email notifications for the selected application.</td>
</tr>
<tr>
<td>![Add Email Notifications Icon]</td>
<td>Add email notifications</td>
<td>Email notification, add</td>
<td>Click this to add an email notification to the selected application, application process, or process step in the &quot;Application notification / edit&quot; dialog box.</td>
</tr>
<tr>
<td>![Delete Email Notifications Icon]</td>
<td>Delete email notifications</td>
<td>Email notification, delete</td>
<td>Click this to delete an email notification in the selected application, application process, or process step in the &quot;Application notification / edit&quot; dialog box.</td>
</tr>
<tr>
<td>Button or Icon</td>
<td>Name</td>
<td>Tooltip (Hover over the button to view the tooltip.)</td>
<td>How to Use It</td>
</tr>
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<td>---------------</td>
<td>-----------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Environment</td>
<td>–</td>
<td>This environment has only static resources and is available.</td>
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<tr>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>This environment has only static resources and is not available.</td>
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<td></td>
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</tr>
<tr>
<td></td>
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<td></td>
<td>This environment has only dynamic resources and is available.</td>
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<tr>
<td></td>
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<td></td>
<td>This environment has only dynamic resources and is not available.</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>This environment is a mixed and is available. Some tiers have dynamic resources while others have static resources.</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>This environment is a mixed and is not available. Some tiers have dynamic resources while others have static resources.</td>
</tr>
<tr>
<td></td>
<td>Environments</td>
<td>–</td>
<td>Click this launch pad to go to the Environments List.</td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expand</td>
<td>Expand</td>
<td>Click this button to see all the changes to an object in the Change History.</td>
</tr>
</tbody>
</table>

ElectricFlow User Interfaces
<table>
<thead>
<tr>
<th>Button or Icon</th>
<th>Name</th>
<th>Tooltip (Hover over the button to view the tooltip.)</th>
<th>How to Use It</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Export Icon" /></td>
<td>Export</td>
<td>Export</td>
<td>Click this button to export the object changes and save them as an XML file.</td>
</tr>
<tr>
<td><img src="image" alt="Help Icon" /></td>
<td>Help</td>
<td>–</td>
<td>Click this button to see the Help text.</td>
</tr>
<tr>
<td><img src="image" alt="Hide Icon" /></td>
<td>Hide</td>
<td>Depends on where it is in the user interface. In the Applications List: Hide running process</td>
<td>Click this button to show less details about the object.</td>
</tr>
<tr>
<td><img src="image" alt="Inventory Icon" /></td>
<td>Inventory</td>
<td>Inventory</td>
<td>Click this button to open the environment inventory.</td>
</tr>
<tr>
<td><img src="image" alt="Lookup Icon" /></td>
<td>Lookup</td>
<td>–</td>
<td>Click this button to open the Parameter Lookup dialog box.</td>
</tr>
<tr>
<td>Button or Icon</td>
<td>Name</td>
<td>Tooltip (Hover over the button to view the tooltip.)</td>
<td>How to Use It</td>
</tr>
<tr>
<td>---------------</td>
<td>------</td>
<td>--------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td></td>
<td>Menu</td>
<td>In the upper left corner of the page, it is referred to as the <em>Main menu</em>.</td>
<td>When you click this button, a destination list opens that includes the launch pads on the Home page.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In the upper right corner of a visual editor, it is referred to as the <em>Context menu</em>.</td>
<td>When you click this button, a list of options appears. Click one of these to view more information about the object.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In the upper right corner of a tier, it is referred to as a <em>Context menu</em>.</td>
<td>When you click this button, a list of options appears. Click one of these to view more information about the Application or Environment tier.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In the upper left corner of a component or resource, it is referred to as a <em>Context menu</em>.</td>
<td>When you click this button, a list of options appears. Click one of these to view more information about the component or resource.</td>
</tr>
<tr>
<td>Process 2</td>
<td>Number of processes –</td>
<td>Click the down arrow next to the number to open the list of existing processes. This also shows the number of application processes for the application.</td>
<td></td>
</tr>
<tr>
<td>Step 1</td>
<td>Number of process steps –</td>
<td>In the ElectricFlow UI, this icon shows the number of steps in the process.</td>
<td></td>
</tr>
<tr>
<td>Button or Icon</td>
<td>Name</td>
<td>Tooltip (Hover over the button to view the tooltip.)</td>
<td>How to Use It</td>
</tr>
<tr>
<td>---------------</td>
<td>------</td>
<td>------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td><img src="image" alt="Map 1" /></td>
<td>Number of tier maps</td>
<td>–</td>
<td>Click the down arrow next to the number to open the list of existing tier maps. This also shows the number of tier maps for the application.</td>
</tr>
<tr>
<td><img src="image" alt="Tier 3" /></td>
<td>Number of tiers</td>
<td>–</td>
<td>In the ElectricFlow UI, this icon shows the number of tiers in an application or environment.</td>
</tr>
<tr>
<td><img src="image" alt="Parameter" /></td>
<td>Parameter</td>
<td>–</td>
<td>When you see this icon in the ElectricFlow UI, the object is a parameter.</td>
</tr>
<tr>
<td><img src="image" alt="Process" /></td>
<td>Process</td>
<td>–</td>
<td>When you see this icon in the ElectricFlow UI, the object is an application or component process.</td>
</tr>
<tr>
<td><img src="image" alt="Process step" /></td>
<td>Process step</td>
<td>–</td>
<td>When you see this icon in the ElectricFlow UI, the object is a step in a component or application process.</td>
</tr>
<tr>
<td><img src="image" alt="Provision" /></td>
<td>Provision</td>
<td>–</td>
<td>When you click this button, you provision cloud resources in a resource templates.</td>
</tr>
<tr>
<td>Button or Icon</td>
<td>Name</td>
<td>Tooltip (Hover over the button to view the tooltip.)</td>
<td>How to Use It</td>
</tr>
<tr>
<td>---------------</td>
<td>------------</td>
<td>------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td><img src="image" alt="Resource" /></td>
<td>Resource</td>
<td>–</td>
<td>When you see this icon in the ElectricFlow UI, the object is a resource. It appears in the Environments List and Environments Visual Editor.</td>
</tr>
<tr>
<td><img src="image" alt="Resource Pool" /></td>
<td>Resource pool</td>
<td>When you see this icon in the ElectricFlow UI, the object is a resource pool.</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Revert" /></td>
<td>Revert</td>
<td>Click this button to revert the object to a previous version.</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Run Process" /></td>
<td>Run process</td>
<td>Click this button to deploy (run) the application. The button is enabled when it is green.</td>
<td></td>
</tr>
<tr>
<td>Button or Icon</td>
<td>Name</td>
<td>Tooltip (Hover over the button to view the tooltip.)</td>
<td>How to Use It</td>
</tr>
<tr>
<td>---------------</td>
<td>---------</td>
<td>------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Schedule</td>
<td>Schedule</td>
<td>Click this button to add or view schedules for an application.</td>
<td></td>
</tr>
<tr>
<td>Search</td>
<td>Launch Change History Search</td>
<td>Click this button to open the Change History - Search dialog box.</td>
<td></td>
</tr>
<tr>
<td>Select</td>
<td>Select All</td>
<td>Click this button to toggle between All and None. Click All to go to None. Click None to go to All. When All appears, all the objects in the list are selected. When None appears, no objects are selected.</td>
<td></td>
</tr>
<tr>
<td>Select None</td>
<td>Select All</td>
<td>Click this button to see all the changes to an object in the Change History.</td>
<td></td>
</tr>
<tr>
<td>Settings</td>
<td>Settings</td>
<td>Click this button to open a list of links to the administration area in the ElectricCommander automation platform. For more information, see the &quot;Settings Menu on page 35&quot; topic.</td>
<td></td>
</tr>
<tr>
<td>Button or Icon</td>
<td>Name</td>
<td>Tooltip (Hover over the button to view the tooltip.)</td>
<td>How to Use It</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------</td>
<td>------------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td><img src="image" alt="" /></td>
<td>Snapshot</td>
<td>Deploy snapshot</td>
<td>Click this button to create a snapshot (New Snapshot) or go to the Snapshot List (Snapshot List). When you see this icon in the Snapshot dialog boxes, the object is a snapshot.</td>
</tr>
<tr>
<td><img src="image" alt="" /></td>
<td>Tear down</td>
<td>–</td>
<td>Click the button to retire a dynamic environment. This button works only on dynamic environments.</td>
</tr>
<tr>
<td><img src="image" alt="" /></td>
<td>Template</td>
<td>–</td>
<td>Depending on where you click the button, clicking this button results on one of these actions:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Display the history of the environment template in the Environments List.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Open a drop-down list of templates that you can use for an email notification setting.</td>
</tr>
<tr>
<td></td>
<td>Email message template</td>
<td></td>
<td>• Open the Environment Templates List.</td>
</tr>
<tr>
<td></td>
<td>Environment template</td>
<td></td>
<td>• Open the Resource Templates List.</td>
</tr>
<tr>
<td></td>
<td>Resource template</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tier</td>
<td>–</td>
<td>When you see this icon in the ElectricFlow UI, the object is an environment tier.</td>
</tr>
<tr>
<td>Button or Icon</td>
<td>Name</td>
<td>Tooltip (Hover over the button to view the tooltip.)</td>
<td>How to Use It</td>
</tr>
<tr>
<td>---------------</td>
<td>------------</td>
<td>-----------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Tier map</td>
<td>–</td>
<td>When you see this icon in the ElectricFlow UI, the object is a tier map.</td>
</tr>
<tr>
<td></td>
<td>Track Changes</td>
<td>Depends on where it is in the user interface.</td>
<td>Click this button to open the Change History for an object. When you hover over this icon, this tooltip appears: Track Changes.</td>
</tr>
<tr>
<td></td>
<td>Unavailable</td>
<td>–</td>
<td>When you see this button in the ElectricFlow UI, the environment is not available. You cannot deploy an application in this environment. When you click this button, the environment becomes available, and you can deploy an application in it.</td>
</tr>
<tr>
<td></td>
<td>View</td>
<td>Depends on where it is in the user interface.</td>
<td>Click this button to show more details about the object.</td>
</tr>
<tr>
<td>Button or Icon</td>
<td>Name</td>
<td>Tooltip (Hover over the button to view the tooltip.)</td>
<td>How to Use It</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------</td>
<td>-----------------------------------------------------</td>
<td>-------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>View details</td>
<td>View details</td>
<td>Click this button to view more details about the object.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Depending on where you are in the ElectricFlow UI, you may go to a new page or dialog box.</td>
<td></td>
</tr>
<tr>
<td>View details</td>
<td>–</td>
<td>Click this button to open the ElectricCommander automation platform.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>A page opens where you can view more details about the object in the ElectricCommander automation platform.</td>
<td></td>
</tr>
<tr>
<td>View only information</td>
<td>–</td>
<td>This information is view only.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ElectricFlow automatically adjusts the page settings to show all the information on the page.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, if application tiers do not fit on the page at 100% magnification, ElectricFlow reduces the magnification until they all appear on the page.</td>
<td></td>
</tr>
<tr>
<td>View path</td>
<td>View path</td>
<td>Click this button to see the path to the object in the change history.</td>
<td></td>
</tr>
</tbody>
</table>

**Landing Page**

*How to get to here:* Enter `http://<commander-server>/flow` in a browser window, where `<commander-server>` is the ElectricCommander server IP address or host name.

To log in, go to the landing page:
Home Page

How to get to here: From the landing page, enter your user name and password and click Sign in. From the Home page, you can model an application for your continuous delivery solution.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Menu button—Click this to open a list of destinations, which includes the list of launch pads on this page.</td>
</tr>
<tr>
<td>2</td>
<td>Search button—Click this to open the Change History - Search dialog box.</td>
</tr>
</tbody>
</table>
Launch pads—Click one of these buttons to start modeling the ElectricFlow application.

- **Applications**—Click this to open the Applications List.
  From this list, you start to model applications by defining the application architecture and modeling the component and application processes.

- **Environments**—Click this to open the Environments List.
  From this list, you start to model the environments in which applications are run by assigning and managing resources.

- **Automations**—Click this to open the Home user interface (UI) in the ElectricCommander automation platform.
  From this page, you start to define procedures and workflows for your software development life cycle in the ElectricCommander automation platform.

### Main Menu

**How to get here:** Click on the **Main menu** button.

These are the main-menu options:

- **Home**—Click **Home** to close this menu and return to the Home page.
- **Applications**—Click **Applications** to open the Applications List.
- **Environments**—Click **Environments** to open the Environments List, Environment Templates List, or the Resource Templates List.
- **Automations**—Click **Automations** to open the Procedures, Workflows, or .
- **Admin**—Click **Admin** to open the Users or Groups page in the ElectricCommander automation platform.

### Applications

When you click **Applications**, the Applications List opens:
Environments
When you click **Environments**, a menu where you select the type of environment to view or create opens.

- When you click **Environments > All Environments**, the Environments List opens.
- When you click **Environments > Environment Templates**, the Environment Templates List opens.
- When you click **Environments > Resource Templates**, the Resource Templates List opens.
- When you click **Environment > Resources**, you go to the ElectricCommander automation platform where the **Resources** page opens.

Automations
When you click **Automations**, this menu opens:

When you click **Automations > Procedures**, the **Procedures** page opens.
When you click **Automations > Workflows**, the **Workflows** page opens.

When you click **Automations > Other**, you go to the ElectricCommander automation platform where the **Projects** page opens.

**Admin**

When you click **Admin**, this menu opens:

When you click **Admin > Users**, you go to the **Users** page in the ElectricCommander automation platform. You can view and manage the ElectricFlow users from this page. For more information about the **Users** page, go to the **ElectricCommander Help > Web Interface Help > Users and Groups**.
When you click **Admin > Groups**, you go to the **Groups** page in the ElectricCommander automation platform. You can view and manage the ElectricFlow groups from this page. For more information about the **Groups** page, go to the **ElectricCommander Help > Web Interface Help > Users and Groups**.

![Groups Page](image1)

When you click **Admin > Plugins**, you go to the **Plugins** page in the ElectricCommander automation platform. You can view and manage the ElectricFlow plugins from this page. For more information about the **Plugins** page, go to the **ElectricCommander Help > Web Interface Help > Plugin Manager**.

![Plugins Page](image2)

When you click **Admin > Server**, you go to the **Server** page in the ElectricCommander automation platform. You can view and manage the access control settings from this page. For more information about the **Server** page, go to the **ElectricCommander Help > Web Interface Help > Server**.

![Server Page](image3)
Settings Menu

How to get here: Click on Settings button. A list of links to the administration area in the ElectricCommander automation platform appears.

<table>
<thead>
<tr>
<th></th>
<th>Settings button</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Settings button</td>
</tr>
</tbody>
</table>
| 2 | Settings-menu options with links to the ElectricCommander automation platform:  
  - Resources  
  - Users  
  - Groups  
  - Plugins  
  - Administration |

When you click a link, you go to one of the following areas in the ElectricCommander automation platform:

**Resources**—View and manage ElectricFlow resources on the Resources page in the ElectricCommander platform. For more information about the Resources page, go to the ElectricCommander Help > Web Interface Help > Resources.
**Users**—View and manage ElectricFlow users on the Users page in the ElectricCommander platform. For more information about the Users page, go to the ElectricCommander Help > Web Interface Help > Users and Groups.

**Groups**—View and manage ElectricFlow groups on the Groups page in the ElectricCommander platform. For more information about the Groups page, go to the ElectricCommander Help > Web Interface Help > Users and Groups.

**Plugins**—View and manage ElectricFlow plugins in the ElectricCommander platform. For more information about the Plugin Manager, go to the ElectricCommander Help > Web Interface Help > Plugins Manager.
Administration—View and manage objects such as groups, users, licenses, and servers in the Administration tab in the ElectricCommander platform. The following UI shows the License page in the ElectricCommander platform. For more information, go to the ElectricCommander Help > Web Interface Help.

Applications List

How to get here:

One of these ways:

- From the Home page, click the Applications launch pad.
- Click the Main menu button, and then click Applications.

1 Breadcrumb showing the total number of applications in your ElectricFlow system.
Click the **Select** button to select all or none of the items in the list. Click the **Delete** button to delete the selected items. Click the **Add** button to add an application.

Click the application name (in this example, **Heat Clinic Store 1.1**) to go to the Applications Visual Editor.

Number of components in the application. This shows that the application has five components.

Number of application processes in the application. This shows that the application has two application processes.

Number of tier maps for the application. This shows that the application has three tier maps.

Click the **Snapshot** button to take a new snapshot when you deploy (run) the application or to add a snapshot to the Snapshot List.

Click the **Run process** button to deploy (run) the application when the button is green. This is enabled when the application has one or more application processes.

Click the **View** button to see more details of the running process.

Click the **View details** button to go to the Applications Visual Editor.

---

**Applications Visual Editor**

**How to get here:** From the Applications List, click an application name.

Applications consist of application processes and components grouped into tiers.

---

1. **Breadcrumb to the application**
2. **Name of the application**
3. **Number of tiers and the Add tier button**
   
   Click the **Add tier** button to add a tier.
4 Click the number of applications (2) button to view the list of application processes for the application.

5 Click the Add process button to add a process.

6 Click the number of tier maps (1) button to view the list of tier maps for the application.

7 Click the Add tier button to add a tier map.

8 Click the Menu button to open the context menu. You can get more details about the application:
   - Details—The name and description of the object.
   - Properties—The properties in the object.
   - Notifications—The email notifications configured for the object.
   - Access Control—The access control configuration in the ElectricCommander platform for the object.
   - Track Changes—The change history of the object.
   - Delete—Delete this object.

9 Application tier with an undefined component

10 Application tier with a defined component

**Application Tiers**

*How to get here:* From the Applications Visual Editor, choose an application tier.

These are application tiers.

- The "App Server" tier has a defined component with two component processes.
- The DB tier has an undefined component.
3. Click the **Menu** button to view the application tier details.

4. Click the **Menu** button to view the component details.

5. Click the **2** (number of component processes) button to view the component processes.

6. Click the **Add process** button to add a component process.

7. Click the **+** button to add a component to the application tier.

8. In an undefined component, click the **+** button to define the component.

**Context Menu for the Application Tier and Component**

This menu appears when you click the **Menu** button:

![Context Menu Diagram]

**In the Application Tier**

- When you click **Details**, the **Application Tier Details** dialog box appears.
  You can edit the application name and description.

- When you click **Properties**, the **Properties** dialog box appears, where you can set the properties for the application tier.

![Properties Dialog Box]

- When you click **Access Control**, you go to the Access Control page for the tier in the ElectricCommander platform, where you can set privileges for the objects in your application.

- When you click **Track Changes**, the Change History Search Form opens.
• When you click **Delete**, the **Delete Application Tier** dialog box appears.

Click **OK** to verify that you want to delete this application tier.

**In the Component**

• When you click **Details**, the **Component Details** dialog box appears. The information that appears depends on your system.

In this example, the **Content Location** is EC-Artifact, the default plugin. In the **Artifact** field, `com.mycompany.heatclinic:config` comes from the Artifact Repository in the ElectricCommander platform.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Content Location of the component</td>
</tr>
<tr>
<td>2</td>
<td>Component details that vary depending on the Content Location</td>
</tr>
</tbody>
</table>
• When you click **Properties**, the component **Properties** dialog box appears. You can set the properties for the component.

In this example, only the top-level component details appear.

When you click the **View** button, all the properties below the current level appear.

You can click the **Hide** button to show less details.

• When you click **Access Control**, the Access Control page for the component in the ElectricCommander platform opens, where you can set privileges for the objects in your application.

For more information, go to the ElectricCommander Help > Overview > Access Control.
When you click **Track Changes**, the Change History Search Form opens.

When you click **Delete**, the **Component Deletion** dialog box opens.

Click **OK** to verify that you want to delete this component.

**Defining Components**

This example shows how to define a component in an application tier.

*How to get to here:* From the Applications Visual Editor, choose an application tier.

1. Click the **Add component** button to add a component.

A new component appears in the application tier.
2. Click the + button to define the component.

   The **New Component** dialog box appears.

3. Enter the name and optional description of the component and click **Next**.

   The **Component Details** dialog box appears.
4. Select the **Content Location**, enter the component details, and click **OK**.

In the following example:

- The new component is named *database.conf*.
- The Content Location is *EC-Artifact*, the default plugin.
- In the **Artifact** field, *com.mycompany.heatclinic:config* comes from the Artifact Repository in the ElectricCommander platform.

<table>
<thead>
<tr>
<th></th>
<th>Content Location of the component</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Component details that vary depending on the Content Location</td>
</tr>
</tbody>
</table>

The Applications tier now has new defined component.
Component Processes

How to get to the Component Process Visual Editor when modeling a new component process:

From the Applications Visual Editor, select a component in an application tier, and click the Add process button.

The New Component Process Details dialog box appears.
<table>
<thead>
<tr>
<th>Field</th>
<th>Description and How to Set It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Name of the process step</td>
</tr>
<tr>
<td>Description</td>
<td>Description of the process step</td>
</tr>
<tr>
<td>Process Type</td>
<td>Type of process. The default is <strong>Deploy</strong>. To set the process type: 1. Click the <strong>Type</strong> field to select the process type. 2. Select one of these options:  <strong>Deploy</strong>—Enables Inventory Tracking. The ElectricCommander server tracks the artifacts deployed to environments.  <strong>Undeploy</strong>—The next time that the process is run, the ElectricCommander server removes information about the artifacts deployed to environments.  <strong>Other</strong>—Disables Inventory Tracking.</td>
</tr>
<tr>
<td>Credential</td>
<td>An object consisting of a user name and password that ElectricFlow uses to run a process step. The dialog box displays the number of credentials for the process step, which are the same credentials that you use with procedures, steps, and schedules in the ElectricCommander platform. You can only impersonate one credential. To set the process type, see Adding Credentials.</td>
</tr>
<tr>
<td>Workspace</td>
<td>Area in the disk space where the files and results of the job step are stored. To set the workspace, click the <strong>Workspace</strong> field to open a drop-down list of workspaces in the ElectricCloud platform and select a workspace. For more information about workspaces, go to the ElectricCommander Help &gt; Workspaces and Disk Management. To set the workspace, click <strong>Workspace</strong> to open a drop-down list of workspaces in the ElectricCloud platform. Select a workspace, and click <strong>OK</strong>.</td>
</tr>
<tr>
<td>Time limit</td>
<td>Maximum length of time that the step is allowed to run. After the time specified, the step is aborted. To set the time limit, enter the time and select the unit of time: seconds, minutes, or hours. For information about time limits for procedure job steps in the ElectricCommander platform, go to the ElectricCommander Help &gt; API Commands.</td>
</tr>
</tbody>
</table>

**How to get to the Component Process Visual Editor after selecting an existing component process:**

From the Applications Visual Editor, select a component in an application tier, click the 2 (number of component processes) button, and then select a component process in the drop-down list.
Component Process Visual Editor UI

The steps in the component process called "install config" appear in the Component Process Visual Editor.

The Component Process Visual Editor has these objects:
<table>
<thead>
<tr>
<th>1</th>
<th>Main menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>This information is view only. ElectricFlow automatically adjusts the page settings to show all the tiers in the application. For example, if all the tiers do not fit on the page at 100% magnification, ElectricFlow reduces the magnification until all the tiers appear on the page.</td>
</tr>
<tr>
<td>3</td>
<td>Breadcrumbs specifying the path to the component: object type/application name/component name</td>
</tr>
<tr>
<td>4</td>
<td>Name of the component process</td>
</tr>
<tr>
<td>5</td>
<td>Number of steps in the process and the Add step button</td>
</tr>
</tbody>
</table>
| 6 | Click the Menu button to view the component process details.  
   - Details—The name and description of the object.  
   - Properties—The properties in the object.  
   - Access Control—The access control configuration in the ElectricCommander platform for the object.  
   - Track Changes—The change history of the object.  
   - Delete—Delete this object. |

The component process has these objects:
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Start of the process</td>
</tr>
<tr>
<td>2</td>
<td>Click this <strong>Connector</strong> button to configure the branching conditions between two process steps. The default is <strong>Always</strong>, which means always go to the next step.</td>
</tr>
</tbody>
</table>
| 3 | Click the **Edit** button (a pencil) to open the process-step details menu.  
- **Details**—The name and description of the object.  
- **Properties**—The properties in the object.  
- **Access Control**—The access control configuration in the ElectricCommander platform for the object.  
- **Add Connector**—Add a connector from the selected step.  
- **Track Changes**—The change history of the object.  
- **Delete**—Delete this object. |
| 4 | Process-step details menu |
Application Processes

How to get to the Application Process Visual Editor when modeling a new application process:

From the Applications Visual Editor, click the Add process button.

The New Application Process Details dialog box appears.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description and How to Set It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Name of the process step</td>
</tr>
<tr>
<td>Description</td>
<td>Description of the process step</td>
</tr>
<tr>
<td>Credential</td>
<td>An object consisting of a user name and password that ElectricFlow uses to run a process step. The dialog box displays the number of credentials for the process step, which are the same credentials that you use with procedures, steps, and schedules in the ElectricCommander platform. You can only impersonate one credential.</td>
</tr>
<tr>
<td>Field</td>
<td>Description and How to Set It</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Workspace</td>
<td>Area in the disk space where the files and results of the job step are stored. To set the workspace, click the <strong>Workspace</strong> field to open a drop-down list of workspaces in the ElectricCommander platform and select a workspace. For more information about workspaces, go to the ElectricCommander Help &gt; Workspaces and Disk Management. To set the workspace, click Workspace to open a drop-down list of workspaces in the ElectricCommander platform. select a workspace, and click OK.</td>
</tr>
<tr>
<td>Time limit</td>
<td>Maximum length of time that the step is allowed to run. After the time specified, the step is aborted. To set the time limit, enter the time and select the unit of time: seconds, minutes, or hours. For information about time limits for procedure job steps in the ElectricCommander platform, go to the ElectricCommander Help &gt; API Commands.</td>
</tr>
</tbody>
</table>

**How to get to the Application Process Visual Editor when selecting an existing application process:**

In the Applications Visual Editor, click the down arrow next to the "number of component processes" button, and then select an application process in the drop-down list.

**Application Process Visual Editor UI**

The steps in the application process called Deploy appear in the Application Process Visual Editor.
The Applications Process Visual Editor has these objects:

1. **Main menu**
2. **This information is view only.**
   ElectricFlow automatically adjusts the page settings to show all the tiers in the application.
   For example, if all the tiers do not fit on the page at 100% magnification, ElectricFlow reduces the magnification until all the tiers appear on the page.
3. **Breadcrumb specifying the path to the application process:** *object type/application name*
4. **Name of the application process**
5. **Number of steps in the process with the Add step button.**
Click the Menu button to view the application process details.

- **Details**—The name and description of the object.
- **Parameters**—Opens the Parameter dialog box where you can view, add, and delete the custom parameters for this application process.
- **Properties**—The properties in the object.
- **Access Control**—The access control configuration in the ElectricCommander platform for the object.
- **Track Changes**—The change history of the object.
- **Delete**—Deletes this object.

### Example: Defining Process Steps

This example describes how to model the process steps in a process visual editor with commands. The procedure to model a component process step in the Component Process Visual Editor is the same as the procedure to model an application process in the Application Process Visual Editor.

- To model steps in an application process, go to the Application Process Visual Editor.

  **How to get to there:** From the Applications Visual Editor, click the Add process button, enter the information about the process in the New Application Process Details dialog box, and click OK.

- To model steps in a component process, go to the Component Process Visual Editor.

  **How to get to there:** From the Applications Visual Editor, select a component, click the Add process button, enter information about the process in the New Component Process Details dialog box, and click OK.

Starting in the appropriate visual editor:

1. Click the button below "Define this Step" to define a process step in the new process.
A dialog box appears.

2. Enter information about the process step.

3. Click **Next**.

The process step dialog box appears.

4. Click **Command** to define the process step with a command.

The **Define Step** dialog box appears.
5. Enter the following information:

- Select **Stop running** or **Continue running** in the **On Error** field.
  - When you select **Stop running**, ElectricFlow stops the job if an error occurs.
  - This step overrides the process branching condition. When an error occurs, the process aborts regardless of the branching condition.
  - When you select **Continue running**, ElectricFlow continues to run the job if an error occurs.
  - This setting overrides the process branching condition. When an error occurs and the branching condition is Failure, the process continues to the next step.
- Enter the postprocessor command in the **Post Processor** field.
- Enter the shell name in the **Shell** field.
- Enter the command in the **Command** field.

6. Click **OK**.

   The step now appears in the process.

7. Click the **+** button below the first step to add another step to the process.

8. Repeat this procedure to define the new step.

### Component and Application Process Steps

This topic describes the **Component Process Step** and **Application Process Step** dialog boxes that you use to model component and application process steps.

### Designing a New Process Step

**How to get to the Component Process Step dialog box:** From the Applications Visual Editor, choose an application tier, select a component, and click the **Add process** button.
How to get to the Application Process Step dialog box: From the Applications Visual Editor, click the Add process button in the upper right corner.
Modeling an Existing Process Step

How to get to the Component Process Step dialog box: From the Applications Visual Editor, choose application tier, select a component, and click the number button (number of component processes).

How to get to the Application Process Step dialog box: On the Applications Visual Editor, click the number button (number of application processes) in the upper right corner.

Setting Parameters in the Process Step Dialog Boxes

Enter information in the following fields:

- **Name** (required)–Name of the process step.
- **Description**–Description of the process step.
- **Tier** (application process step only)–Application tier in which the process step runs.
- **Credential**—An object consisting of a user name and password that ElectricFlow uses to determine who or what runs a process step.

  The field displays the number of credentials for the process step, which are the same credentials that you use with procedures, steps, and schedules in the ElectricCommander platform.

  To set the credentials, click > to open the Credentials dialog box.

  You can add only one credential for impersonation, and you can attach more than one credential to the process step.

  If a credential is set to impersonate, you can also attach that credential to the process step.

  For more information about credentials, go to the ElectricCommander Help > Credentials and User Impersonation.

- **Workspace**—Area in the disk space where the files and results of the job step are stored.

  To set the workspace, click the Workspace field to open a drop-down list of workspaces in the ElectricCommander platform and select a workspace.

  For more information about workspaces, go to the ElectricCommander Help > Workspaces and Disk Management in the ElectricCommander Help.

  To set the workspace, click Workspace to open a drop-down list of workspaces in the ElectricCommander platform, select a workspace, and click OK.

- **Time limit**—Maximum length of time that the step is allowed to run. After the time specified, the step is aborted.

  To set the time limit, enter the time and select the unit of time: seconds, minutes, or hours.

  For information about time limits for procedure job steps in the ElectricCommander platform, go to the ElectricCommander Help > API Commands.

### Parameters in Application Processes

Starting in ElectricFlow 5.4, you can define and apply custom parameters to application processes to automate your deployments. You define the parameters and apply them while deploying the application or while defining an application process step.

When deploying an application, you can specify parameter values that determine how to deploy the application. The parameter value can be a credential that specifies who can deploy the application, a value that represents the specific artifacts and artifact versions to deploy, the name of a specific schedule to apply, or the name of a snapshot to deploy. You can also specify if the deployment type is full deploy, smart deploy, or partial deploy. You can specify parameter values the same way in a process step to determine when or how to execute it.

**How to get here**: One of these ways:

- From the Home page, click the Applications launch pad, click the application name, select an application process, click the Menu button in the Application Process Visual Editor, and click Parameters.

- From the main menu on the Home page, click Applications, click the application name, select an application process, click the Menu button in the Application Process Visual Editor, and click Parameters.

The Parameters dialog box opens.
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of parameters.</td>
</tr>
<tr>
<td>2</td>
<td>Name of the application process.</td>
</tr>
<tr>
<td>3</td>
<td>Name of the parameter.</td>
</tr>
</tbody>
</table>
| 4 | Type of parameter:  
  - Text Entry  
  - Text Area  
  - Dropdown Menu  
  - Radio Selector  
  - Checkbox  
  - Credentials |
| 5 | This parameter is required when there is a check in this column. |
| 6 | Click this button to add a parameter. |

When parameters are defined for the application process, a parameter list appears in the **Parameters** dialog box.
You can change the order in which the parameters appear in the UI form.

1. In desktop mode, mouse over the button and drag it to the new location.

2. In touch screen mode, touch and hold the button and drag it to the new location.

Select a row and click the arrow at the end of the row to open the **New Parameters** dialog box.

When you click **There are no Parameters yet. Add one +**, the **New Parameters** dialog box opens.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name of the new parameter.</td>
</tr>
<tr>
<td>2</td>
<td>(Optional) Description of the new parameter.</td>
</tr>
</tbody>
</table>
| 3 | (Optional) **Label** for the parameter.  
   - If you enter a **Label**, it appears in the UI form when you deploy the application.  
   - If you do not enter a label, the parameter name appears in the UI form when you deploy the application. |
Click the down arrow in the Select Parameter field to select the parameter type:

- Text Entry
- Text Area
- Dropdown Menu
- Radio Selector
- Checkbox
- Credentials

Depending on the type that you select, other fields appear in the dialog box. For examples, go to Setting Parameters for Application Processes on page 238.

Required check box
When you click the Help button, this help text appears:

By default, this parameter is required. The application does not run when the parameter does not have a value.

Defeer Expansion check box
When you click the Help button, this help text appears:

When the Defeer Expansion check box is selected and the parameter value contains $[$, ElectricFlow does not interpret it as a parameter reference and instead interprets it literally.

Environments List

How to get here: One of these ways:

- From the Home page, click the Environments launch pad.
- From the main menu on the Home page, click the Environments destination.

The Environments List opens.

1 Breadcrumb showing the total number of environments in your ElectricFlow system.
You can view the environments, environment templates, or resource templates for all of the environments in your system.

- Select the **Environments** tab to view the list of static, dynamic, and mixed environments. You can view details about the environments, environment tiers, and resources in the tiers.
- Select the **Environment Templates** tab to view the list of available environment templates. You can use these templates to create environment when deploying an application.
- Select the **Resource Templates** tab to view the list of available resource templates. Resource templates have the necessary information that ElectricFlow uses to dynamically spin up resources in the cloud when deploying an application.

By default, no environments, environment templates, and resource templates are configured. You create the ones you need to deploy applications in ElectricFlow.

3  Click the **Select** button to select all or none of the items in the list.
   Click the **Delete** button to delete the selected items.
   Click the **Add +** button to add an environment.

4  Click the **View details** button to go to the Environments Visual Editor.

5  Click the **View** button to view more details about the environment.

6  Click the **Inventory** button to open the environment inventory, where you can see the status of an application as it runs and additional information about the application for troubleshooting.

7  Click the **Template** button to view the history of the environment template.

8  Click the **Tear down** button to retire the dynamic environment. This button works only with dynamic environments.

9  Number of applications that run in the environment.

10 Number of resources in the environment.

11 Number of environment tiers in the environment.

12 Click the environment name (in this example, **CloudEnv**) to go to the Environments Visual Editor.

13 Static environment.

14 Dynamic environment.

You can determine the type of environment and the status of the environment by its icon and color:
<table>
<thead>
<tr>
<th>Type of Environment</th>
<th>Available</th>
<th>Not Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static (only static resources)</td>
<td>![Icon]</td>
<td>![Icon]</td>
</tr>
<tr>
<td>Dynamic (only dynamic resources)</td>
<td>![Icon]</td>
<td>![Icon]</td>
</tr>
<tr>
<td>Mixed (some tiers with dynamic resources and other tiers with static resources)</td>
<td>![Icon]</td>
<td>![Icon]</td>
</tr>
</tbody>
</table>

You can set the status of an environment in the Environments Visual Editor.

When you click the **Template** button, you view the history of the template:

![Template History Image]

When you click the **View** button for a specific environment, details about the environment tiers and resources for the environment appear.

![View Environment Image]

1. Name of the environment tier with the tier row numbering.
   - **Tier 1** is the first tier and **Tier 2** is the second tier.
Environments Visual Editor

**How to get to here:** From the Environments List page, select an environment.

Environments consist of resources that are grouped into tiers. The component and application processes run on resources assigned to environments.

To run applications, you must configure tier maps of application tiers to environment tiers.

The following information is on this page:

<p>| 1 | Breadcrumb to the environment |
| 2 | Name of the environment |</p>
<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 3    | Button showing the status of the environment  
- The environment is available when it is green.  
- It is unavailable when it is red.  
To change the status from **Available** to **Unavailable**, click this button. It becomes ![Unavailable](image)  
To change the status to **Available**, click the button again. |
| 4    | Number of environment tiers |
| 5    | Click the **Add tier** button to add an environment tier. |
| 6    | Click the **Menu** button to open the context menu. You can get more details about the environment:  
- **Details**—The name and description of the object.  
- **Properties**—The properties in the object.  
- **Access Control**—The access control configuration in the ElectricCommander platform for the object.  
- **Track Changes**—The change history of the object.  
- **Delete**—Delete this object. |

The appearance of the resources in an environment tier changes when you assign a resource that is defined and managed by the ElectricCommander automation platform.

After you add an environment tier:

![Environment Tier](image)

After you assign a resource to the tier:
Environment Tiers

How to get here: From the Environments Visual Editor, choose an environment tier.

Environment tiers consist of resources that can be assigned to applications.

The following information is available about the tier.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Click the <strong>Menu</strong> button to view the resource details.</td>
</tr>
<tr>
<td>2</td>
<td>Click the <strong>Menu</strong> button to view the tier details.</td>
</tr>
<tr>
<td>3</td>
<td>Name of the environment tier</td>
</tr>
<tr>
<td>4</td>
<td>Click the <strong>Edit</strong> button to edit the tier name and description in the <strong>Environment Tier Details</strong> dialog box.</td>
</tr>
<tr>
<td>5</td>
<td>Click the + button to add a resource to the environment tier.</td>
</tr>
</tbody>
</table>

Context Menu for the Environment Tier

This menu appears when you click the **Menu** button:
When you click **Details**, the **Environment Tier Details** dialog box appears. You can edit the environment name and description.

When you click **Properties**, the Properties dialog box appears, where you can set the properties for the environment tier.

When you click **Access Control**, you go to the Access Control page for the tier in the ElectricCommander automation platform, where you can set privileges for the objects in your environment.

For more information about the Access Control page, go to the ElectricCommander Help > Projects > Select a project > Access Control.

When you click **Track Changes**, the Change History Search Form opens.

When you click **Delete**, the **Delete Environment Tier** dialog box appears.

Click **OK** to verify that you want to delete this environment tier.

**Context Menu for the Resource**

This menu appears when you click the **Menu** button for a resource.
• When you click **Details**, the resource list appears. It shows the resource name, the resource platform, the status (up or down), and where it is used.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Name of the resource</strong></td>
</tr>
<tr>
<td>2</td>
<td>The resource platform</td>
</tr>
<tr>
<td>3</td>
<td>Status of the resource: Up or down.</td>
</tr>
<tr>
<td>4</td>
<td>Environment to which the resource is assigned</td>
</tr>
<tr>
<td>5</td>
<td>Enter the search criteria in this field to search for specific resources.</td>
</tr>
</tbody>
</table>
| 6 | Click the **View details** button to go to the Resources page in the ElectricCommander automation platform.  
   For more information about the Resources page, go to the **ElectricCommander Help > Web Interface Help > Resources**. |
| 7 | Details about the resource you selected.  
   If you want to change the resource details, you can replace this resource with an available resource. |
| 8 | This resource is not available because it is assigned to an environment other than the `hc-store dev` environment. |

• When you click **Remove**, the resource list appears.

After selecting the resources that you want to delete, click **OK**.

The resources that you selected are deleted from the environment tier but are not deleted from the application or the ElectricCommander automation platform.

**Adding Resources to an Environment Tier**

In an environment tier, click the + button to open the resource list, select one or more available resources in the resource list, and click **OK**.
The environment tier in the Environment Visual Editor is updated and now shows that there are more resources in the environment tier.

**Environment Templates List**

**How to get here:** One of these ways:

- From the Home page, click the Environment launch pad, and then click the Environment Templates tab.
- From the main menu on the Home page, click Environments > Environment Templates.

The Environment Templates List opens.

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name of the environment template.</td>
</tr>
<tr>
<td>2</td>
<td>Number of tiers in the template.</td>
</tr>
<tr>
<td>3</td>
<td>Last activity on the environment template.</td>
</tr>
<tr>
<td>4</td>
<td>User who performed that last activity on the resource.</td>
</tr>
<tr>
<td>5</td>
<td>Number of environments currently live from this template.</td>
</tr>
<tr>
<td>6</td>
<td>Number of times that this template has been used.</td>
</tr>
<tr>
<td>7</td>
<td>Click the <strong>Track Changes</strong> button to start a change history search.</td>
</tr>
<tr>
<td>8</td>
<td>Click the <strong>View details</strong> button to go to the Environment Templates Visual Editor. It has the same elements as the Environments Visual Editor.</td>
</tr>
</tbody>
</table>

This is the Environment Templates Visual Editor for **AWStest**.
Resource Templates List

**How to get here:** One of these ways:

- From the Home page, click the **Environments** launch pad, and then click the **Resource Templates** tab.
- From the main menu on the Home page, click **Environments > Resource Templates**.

The Resource Templates List opens.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name of the resource template.</td>
</tr>
<tr>
<td>2</td>
<td>Number of resource pools.</td>
</tr>
<tr>
<td>3</td>
<td>Third-party plugin for the cloud provider or configuration management.</td>
</tr>
<tr>
<td>4</td>
<td>Last activity on the environment template.</td>
</tr>
<tr>
<td>5</td>
<td>User who performed that last activity on the resource.</td>
</tr>
<tr>
<td>6</td>
<td>Click the <strong>View</strong> button to view more information about the resource template.</td>
</tr>
<tr>
<td>7</td>
<td>Click the <strong>Menu</strong> button to view details about the resource template.</td>
</tr>
<tr>
<td>8</td>
<td>Click the <strong>View details</strong> button to view more details about the resource pool.</td>
</tr>
<tr>
<td>9</td>
<td>How long the resource has been available since it was created.</td>
</tr>
<tr>
<td>10</td>
<td>Name of the resource pool.</td>
</tr>
</tbody>
</table>

**Tier Maps**

**How to see a Tier Map:** From the Applications Designer, click the down arrow in this button to show a drop-down list of configured tier maps. Then select a tier map to view.

**Example:**

![Tier Map Example](image)

**How to add a Tier Map:** Click the **Add tier map** button to add a tier map an application.
**Example:**

A tier map is a mapping of application tiers to environment tiers for a specific application and environment. You must configure a tier map if you want to run an application.

This tier map shows the mapping between the Heat Clinic Store 1.1 application and the environment called hc-store dev. Each application tier is mapped to an environment.

You can map more than one application tier to the same environment tier.
Application Notifications Dialog Box

How to get here: From the Applications Visual Editor, click the Menu button, and select Notifications.

The following information is in this dialog box.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 1 | Notifications toggle. Click this to enable (On) or disable (Off) email notifications for the application.  
   • Enable—The system sends email notifications to the specified recipients.  
   • Disable—The system do not send email notifications. |
| 2 | Name of the application. |
### Setting Notifications for the First Time

New email notifications are disabled in the application, its application processes, and the process steps before you configure them.

You configure notifications in the "Application notifications / edit" dialog box.

**IMPORTANT:** The first time that you set notifications in this dialog box, the Notifications toggle changes to **On**. After you enter notification settings and click **OK**, email notifications are enabled at that level.

To see the notification settings for the application processes and process steps, click the **View** button. The settings for the application processes appear.

**Example:**

Click the **View** button for each application process. The settings for processes steps appear.
Enabling Notifications

You can enable notifications at the application, application process, and process levels.

To enable email notifications at the application level:

- Click the Notifications toggle and change it to **On**.

  The status of the application changes to **On**.

**Example:**
• Click the Edit button to open the Application notifications / edit dialog box.

The Application notifications / edit dialog box appears. The Notification toggle changes to On.

**Example:**

![Application notifications / edit dialog box](image)

To enable notifications at the application process and process step levels, go to the Application Notifications / edit dialog box for the specific process or process step.

The dialog box opens, and the Notifications toggle is now **On**.

**Example:**

![Application notifications / edit dialog box](image)

When you enter notification settings in the dialog box and click **OK**, the settings are saved. The Application notifications dialog box appears and now shows that the application process status is **On**.
**Example:**

![Image of ElectricFlow User Interface](image)

**Adding Notifications**

You can configure one or more notifications in an application process or other object.

**Configuring recipients**

In the **Who** field, you add users or groups who are configured and managed in the ElectricCommander platform or email addresses.

When you start typing a user name, group name, or email addresses, a list of names or email addresses appear that match what you are typing.

**Example:**

![Image of ElectricFlow User Interface](image)

If one of the suggestions matches the name or email address, select it, or continue typing. You can add more than one name or email address.

**Example:**
Configuring the event that triggers the notification

In the **When** field, you select the event that triggers a notification to be sent to the recipients in the **Who** field. The default is **Both Failed and Successful**. Click in the **When** field to select the event for the notification.

**Example:**

![Application notifications / edit](image)

Configuring the environments where the notification applies

In the **Where** field, you select the environments to which the notifications apply. Click in the **Where** field to select the environments, which are the environments to which the application is mapped in the tier map.

**Example:**
Adding More Notifications

Click the Add Notifications button to add a new notification.

Example:

[Image]

After you have added your email notifications, click OK to save the settings and return to the Application notifications dialog box.

Example:

[Image]

Deleting Notifications

Click the Delete Notification button to delete a notification when there are more than two notifications.
Disabling Notifications

You can disable all email notifications or specific ones in the application.

- When you disable the email notifications for an application, all email notifications, including the ones for application processes and process steps, are disabled.
- You can disable the email notifications for an application process but still keep the notifications enabled for process steps in the application.

Applications

To disable email notifications for the application:

- Click the Notifications toggle in Application notifications dialog box.

  The toggle and the status of the application change to Off.

- When you use the "Applications notification / edit" dialog box:
  a. Click the Edit button to open the dialog box.
  b. Click the toggle to change it to Off, and then click OK. The Application notifications dialog box opens with the updated status.
**Application Processes and Process Steps**

To disable notifications, click the Notifications toggle and then click **OK** in "Application notifications / edit" dialog box. The toggle changes to **Off**.

The Application notifications dialog box now shows that email notifications are disabled for the application, its application processes, and process steps.
Related Topics:
- Setting Email Notifications on page 254
- Selecting and Editing Email Messages on page 262

Change History Search Form

How to get here: From the Home page, click the Search button to open the "Change History - Search" form.

Example:

![Search button](image)

The "Change History - Search" form has the following information:

How to get here: From the Change History page, click the Search button in the upper right corner to open the "Change History - Search" form.
The "Change History - Search" form has the following information:

Time range.
Click this to open the drop-down list of start times for the Change History search.

The end time is the current time. You can change the end time after you run the search and get the search results.
Objects to include in the search.
You can select All Objects or specific objects.
By default, seven of the most commonly tracked objects are selected.

Enter the search criteria in this field.
After you type the first character, the system starts searching for objects based on the time range and objects that you selected.
The search results are in the Change History.

Change History Page

How to get here: Click the Change History button for a tracked object.

Example:

The Change History has this information about the object called Proc:
Time line
You can modify the start and end times.

Default:
- The entire time line is selected. All changes appear in the Change History list.
- The time increment is from the Last Successful Run to the most current change.
- The start time is based when the last successful run occurred.
- The end time is when the most recent changed occurred.

Path to the tracked object.
Example:

Click to revert the selected changes.

Click to export the changes to the object as an XML file.
Time line.
The start time is based on the time range that you selected.
The end time is the current time.
You can manually change the start and end times after you run the search and get the search results.

Filters for the change history.
You can view all changes or view only selected changes.
The objects in the list are the objects in the change history search results.

Change history for the selected object.
- When—the date and time that the object changed.
- What—The type of object.
- Name—The name of the object.
- By—The "user" that changed the object, which can be a project or a user.
- Change—The type of change.
- Path—Click the View Path button to see the path to the object.

Paths to Objects
Click the View Path button next to the "Change History for JPetStore" title to see the path to the application.

Click the View Path button to see the change in the path to the object before and after the change.
Detailed Object Changes

Click the View button to see the change in the property called emailNotifier.

Click the Expand button to all the changes to the property,

Example:

When you click the Expand button in a cell, you can see more details in the current change in the cell.
If you click the Select All button, all the changes about the object appear.

To select an object to revert or import the changes to an XML file, select the row of the object in the expanded view.

Snapshot List

How to get here: From the Applications List, select an application > click the Snapshot button > select Snapshot List.
Example:

This example shows a Snapshot List with no snapshots:

1. Breadcrumb to the Snapshot List: Applications/<Application name>
2. Number of snapshots.
3. **Add +** pane.
   Click anywhere in the pane to add a snapshot. The New Snapshot dialog box opens.
4. Click on **Add +** to add a snapshot. The New Snapshot dialog box opens.

This Snapshot List has three snapshots:

1. Breadcrumb to the Snapshot List: Applications/<Application name>
2. Number of snapshots.
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| **3** | **Delete** button.  
After you select one or more snapshots in the list, the **Delete** button is available (enabled). Click this to delete the snapshots that you selected. |
| **4** | Compare snapshots from a list.  
This is available (enabled) when the list has two or more snapshots.  
Click this to open a full-screen window and view two snapshots next to each other.  
After the window opens, you can select snapshots on both sides and compare those snapshots.  
The default is have the most recent snapshot on the left and the previous snapshot on the right.  
You do not have to select a snapshot to open the full-screen window and view two snapshots. |
| **5** | If you click **All**, all the snapshots are selected.  
If you click **None**, none of the snapshots are selected. |
| **6** | Add a snapshot. |
| **7** | Snapshot name. |
| **8** | Time stamp when the snapshot was created. |
| **9** | The user who created the snapshot. |
| **10** | **View details** button.  
Click this to go to the Snapshot Details pages. |

**Snapshot Details Page**

**How to get here:** From the Snapshot List, click the **View Details** button.

**Example:**

![Snapshot Details Page Example](image-url)
This is the Component view.

<table>
<thead>
<tr>
<th></th>
<th>Breadcrumb to this Snapshot Details page: <strong>Applications/&lt;Application name&gt;/Snapshots</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Name of the snapshot.</td>
</tr>
<tr>
<td>3</td>
<td>Number of components in the snapshot.</td>
</tr>
<tr>
<td>4</td>
<td>Component name.</td>
</tr>
<tr>
<td>5</td>
<td>Component process name.</td>
</tr>
<tr>
<td>6</td>
<td>Artifact name.</td>
</tr>
<tr>
<td>7</td>
<td>Artifact version.</td>
</tr>
<tr>
<td>8</td>
<td>Time stamp when the component process was last modified.</td>
</tr>
<tr>
<td>9</td>
<td>Number of component process for the component.</td>
</tr>
</tbody>
</table>

This is the App Process view.
This is the Environment view.

**Snapshot Dialog Boxes**

- **New Snapshot Dialog Box** on page 92
- **Component View in the New/Preview Dialog Box** on page 92
- **Modifying the Artifact Version** on page 94
- **App Process View in the New/Preview Dialog Box** on page 95
New Snapshot Dialog Box

**How to get here:** From the Applications List, click the **Snapshot** button > select **Snapshot List** > click in the **Add one. + pane** or click **Add+** in the Snapshot List.

The New Snapshot dialog box opens.

![New Snapshot Dialog Box](image)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name for the snapshot that must be unique within the application.</td>
</tr>
<tr>
<td>2</td>
<td>(Optional) Description of the snapshot.</td>
</tr>
</tbody>
</table>

Component View in the New/Preview Dialog Box

**How to get here:** In the New Snapshot dialog box, enter the snapshot name and the optional description, and click **Next**.

The New/Preview dialog box opens.
1. Go back to the New Snapshot dialog box.

2. Application name.

3. Snapshot name.

Before a snapshot is deployed, only the Component and App Process views are available.

After the snapshot is deployed, Component, App Process, and Environment views are available.
5 | Number of components.
6 | Number of application processes.
7 | Component number (not the row number) and component name. When you click the View icon to show the component details, the component processes rows do not have numbered.
8 | Name of the artifact associated with the component.
9 | Version of the artifact. Click the down arrow to open the drop-down menu where you can select a different artifact version.
10 | Click the View button to show the component details.

When you choose a component and click the View button, the component process information appears.

![Component Details]

| 1 | Name of the component process. |
| 2 | Time stamp when the component process was last run. |

**Modifying the Artifact Version**

This example shows the current version of each component, which is Latest.
1. Current version of the artifact.

2. Possible artifact versions.
   To modify the artifact version in the snapshot, click the down arrow in the Version column to open a drop-down menu. You can select a version or enter the one that you want to use.

**App Process View in the New/Preview Dialog Box**

When you toggle to the App Process view, the following information appears.
<table>
<thead>
<tr>
<th></th>
<th>Application name.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Snapshot name.</td>
</tr>
<tr>
<td>3</td>
<td>Number of application processes in the application.</td>
</tr>
<tr>
<td>4</td>
<td>Name of the application process.</td>
</tr>
<tr>
<td>5</td>
<td>Time stamp when the component process was last run.</td>
</tr>
</tbody>
</table>

### Inventory Tracking

Electric Flow uses Inventory Tracking to track what is built, tested, and deployed in your continuous delivery solution, including artifacts, the artifact version, resources on which the applications are run, and environments to which the resources are assigned.

If there is an issue in an application in operations, you can find the details about what was deployed with Inventory Tracking.

### Tracking at the Component Process Level

Inventory Tracking occurs at the component process level.

You design the component process as one of the following process types in the Component Process Details dialog box:

- **Deploy**—Enables Inventory Tracking. The ElectricCommander server tracks artifacts deployed to environments. This is the default.
- **Undeploy**—After the first successful job step in a component process with this setting, the ElectricCommander platform removes the environment inventory record.
- **Other**—Disables Inventory Tracking.
Environment Inventory

**How to get here:** From the Environments List, choose an environment and click the **Inventory** button. The Environment Inventory for that environment appears.

The Environment Inventory is the state of the environment at a point in time.

- When an application is running, you can see the progress as it runs.
- After an application runs, you can see the details for the objects in application that ran in the environment.

Click the **View details** button in a row to see more details about a specific object including

- Environment name
- Application mapped to this environment
- Number of deployed artifacts in the application
- When the artifacts were deployed
- Status of the deployment: success or failure

In this example, the Environments List shows that an application was run on the "hc-store dev" environment and has one error.
The first level of the Environment Inventory appears.

In the second level, you can view more details. Click the View arrows at the end of the row. The applications mapped to this environment appear.

To show more details in the third level, click the **Process** button at the end of the env.sh row.
In the fourth level, you can get more information for the steps in the Install component process by clicking on the "View details" arrow in the "get files," "place file," and "restart Tomcat" rows.

The Environment Inventory shows this information:

- Environment name: hc-store dev
- Name of the application mapped to this environment: Heat Clinic Store 1.1
- Components in the application: See the second level.
- Number of the artifacts associated with components: Six. For details, see the first and second levels.
- Each component has an artifact with a version number: See the second level.
- Each component is also in an application tier: See the second level.
- Time when the artifact was deployed: See the third and fourth levels.
- Error counts if there are any errors: See the third and fourth levels.
- Number of resources that are successfully assigned to applications on a per-artifact basis: See the third and fourth levels.

**Application Inventory**

**How to get here:**
- From the Home page, click the **Applications** launch pad.
- From the main menu on the Home page, click the **Applications** destination.

The Application Inventory is the state of the application at a point in time.
- When an application is running, you can see the progress as it runs.
- After an application runs, you can see the results for any object in application.

Click the **View details** button in a row to see more details about object.

The following example shows that the application called "app-1" ran successfully on July 30, 2014, at 4:18 pm.

Click the right arrow in the 6_Test2 row to see the detailed results. The process has three steps, which were all successfully run.
The following shows that the application called "Heat Store Clinic 1.1" did not run successfully on July 30, 2014, at 4:28 p.m.

Click the right arrow in the 4_Undeploy row to see the detailed results. The process has two steps that ran successfully, a component called "undeploy war file" with errors, three skipped objects, and five errors.
To troubleshoot the errors, you can click the right arrow in one of the "undeploy war file" rows and you go a Job Step Detail page in the ElectricCommander platform.

**Viewing Job Details**

When you run a process in an application, the system records the results of the process as each step is performed. You can see a summary of the results in the Applications Inventory.

This example shows the results of running the Deploy Web application process, which consists of the Deploy Cloud component process.
When you run the Deploy Web process, you can see the status of the process as it runs in the Application Inventory.

You can also see which application processes were run, with the latest process appearing first.
To see more details about the process, click the process about which you want more information. If you want to learn more about the 2_Deploy Web process, click 2_Deploy Web in the Applications Inventory. It now shows the details for the process that you selected.

Notice the order of the process steps in the Applications Inventory. The order is not based on the branches in the process. Instead, the system lists the steps based on their level in the process.

- Step S1 is the first step in the process and is listed first. There are no other steps at this level so the next step is in the level following S1.
- The next step in the list is s2.
- Step s3 is on the same level as s2. There are no other steps at this level so the next step is in the level after this.
- The next step is s4.
- Step s5 is on the same level as s4. There are no other steps at this level so the next step is in the level after this.
- The last step is s6.

Related Topics:
- ElectricFlow Buttons and Icons on page 15
- Home Page on page 30
- Environments List on page 62
Modeling and Deploying Applications in Static Environments

This topic describes how to model an application, deploy it in a static environment, and view and troubleshoot the results. In this workflow, you create a static environment with resources in your system or network, such as servers, databases, machines, and virtual machines (VMs), before deploying the application. It does not describe how to create dynamic environments with cloud resources that are spun up when you deploy the application. For information about the dynamic environment workflow, go to Modeling and Deploying Applications in Dynamic Environments on page 210.

The following tasks describe how to model and deploy (run) applications at a high level.

1. Logging in to ElectricFlow on page 212
2. Modeling Applications on page 213
3. Modeling Environments on page 166
4. Making Tier Maps on page 171
5. Deploying (Running) Applications on page 173
6. Viewing Results and Troubleshooting on page 197

For information about the UI, see the ElectricFlow User Interfaces on page 15 topics.
More about application, deploy, and run:

As you use ElectricFlow, remember that these terms have different meanings within ElectricFlow *and* outside of ElectricFlow when you deploy your software or application:
<table>
<thead>
<tr>
<th>Term</th>
<th>Within ElectricFlow</th>
<th>Outside of ElectricFlow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>The application that you design and run (deploy) to produce your software for continuous delivery across different pipelines.</td>
<td>The software, system or application that you build, test, install, implement, release, and deploy using ElectricFlow. This is the end product of using ElectricFlow.</td>
</tr>
<tr>
<td>Deploy</td>
<td>Running the application that you designed in ElectricFlow. The end product is your software, system, or application. Deploy is a synonym of run in ElectricFlow.</td>
<td>All the processes or actions to develop and run your software in its environment, including building, testing, implementing, installing, configuring, making changes, and releasing.</td>
</tr>
<tr>
<td>Run</td>
<td>Running the application that you designed. The end product is your software, system, or application. <em>Run is a synonym of deploy in ElectricFlow.</em></td>
<td>All the processes or actions to use software in its environment, including implementing, installing, configuring, debugging, troubleshooting, and releasing.</td>
</tr>
</tbody>
</table>

**Logging in to ElectricFlow**

1. Enter http://<commander-server>/flow in a browser window, where <commander-server> is the ElectricCommander server IP address or host name.

   For example, when you go to https://123.123.1.222/flow/, the landing page opens.

   **Example:**
IMPORTANT: For a new installation, the default admin account user name is *admin* and the password is *changeme*. You should change the default admin password as soon as possible.

2. Enter a user name and password.

3. Click **Sign in**.

   The ElectricFlow Home page opens.

**Modeling Applications**
1. Create an application and application tiers.
2. Add components to the application tiers.
3. Model component processes.
5. (Optional) Set email notifications and edit the email messages.

Creating an Application and Application Tiers

Starting from the Home page:
1. Go to the Applications List by either
   - Clicking the Applications launch pad.
   - Clicking the Menu button > Applications.
The Applications List opens.

2. Click the **Add +** button in the upper right corner.

   **Example:**

   ![Add button]

The New Application dialog box appears.

   **Example:**

   ![New Application dialog box]

There are two ways to create an application:

- Click **Create new app** to create a new application.
- Click **Create from existing** to create an application based on an existing application.

3. Create the application by going to appropriate next step.

   - To create a new application, go to Creating a New Application on page 216.
   - To create an application based on an existing application, go to the next step.
4. Click **Create from existing** to create an application based on an existing one.

The new application will have the same objects (components, artifacts, and application processes) as the existing application. However, it is not an exact copy of it because you need to configure new tier maps for it.

The **New Application from Existing** dialog box opens.

   a. Select an application.

      The **New Application Name** dialog box opens with the name of the application you selected in the **Name** field.

   b. Enter a name in the **Name** field.

      It must not match the name of another application in the project.

   c. (Optional) Enter a description of the application in the **Description** field.

   d. Click **OK**.

If you are modeling an application based on an existing application, the Applications Visual Editor displays the same application tiers and components as the existing application with the name that you entered.

---

**Creating a New Application**

Starting in the Applications List:

1. Click the **Add +** button in the upper right corner.

   **Example:**

   ![Add button]

   The New Application dialog box appears.

   **Example:**

   ![New Application dialog box]
2. Click **Create new app** to create an application.

   The **New Application Name** dialog box opens.

   a. Enter a name in the **Name** field.

   b. (Optional) Enter a description of the application in the **Description** field.

   c. Click **OK** to save the settings.

   If you are modeling a new application, the Applications Visual Editor displays an application tier called Tier 1 with one component called Component.

   **Example:**

   ![Application Tier Details](image)

3. Go to **Defining Components** on page 43 to set the component details.

### Adding Components to the Application Tiers

Starting in the Applications Visual Editor:

1. Click the **Edit** button.

   The **Application Tier Details** dialog box opens.

2. Change the name of the tier and click **OK**.

   **Example:**

   Change the name to **Web Server** and click **OK**.

   The Applications Visual Editor now has an application tier called Web Server.

3. Click the **+** button in the component.

   The **New Component** dialog box opens.

4. Enter a name in the **Name** field.

5. (Optional) Enter a description of the component in the **Description** field.
6. Click **Next** to save the settings.
   The Component Details dialog box opens.

7. Click the **Current Location** field.
   A list of available artifact locations appears.

8. Select a location and click **Browse**.
   The information needed to define the artifact appears below.

9. Enter the appropriate information in the fields.

**Example:**

<table>
<thead>
<tr>
<th></th>
<th>Content Location of the component</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Component details that vary depending on the Content Location</td>
</tr>
</tbody>
</table>
10. Click **OK**.

The Applications Visual Editor now shows an application tier called Web Server with a component called **hello_world**.

**Example:**

![Image of Web Server component](image)

11. To add a component to the same tier, click the + button in the lower right corner of the tier.

A new undefined component appears in the tier.

12. Configure this component the same way you did the first one.

**Adding a Component**

To add a component to the same application tier:

1. Click the + button in the lower right corner of the tier.

A new undefined component appears in the tier.

2. Click the + button in the new component to set the component details, following the steps previously described.

**Adding an Application Tier**

To add an application tier, click the **Add tier** button.

**Modeling Component Processes**

Starting in the Applications Visual Editor:

1. Click the **Add Process** button in a component to a component process to it.

**Example:**

![Image of Add Process button](image)

The **New Component Process Details** dialog box opens.
2. Enter information about the component process in the Component Process Details dialog box.

Example:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description and How to Set It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Name of the process step</td>
</tr>
<tr>
<td>Description</td>
<td>Description of the process step</td>
</tr>
<tr>
<td>Process Type</td>
<td>Type of process. The default is <strong>Deploy</strong>. To set the process type:</td>
</tr>
<tr>
<td></td>
<td>1. Click the <strong>Type</strong> field to select the process type.</td>
</tr>
<tr>
<td></td>
<td>2. Select one of these options:</td>
</tr>
<tr>
<td></td>
<td>- <strong>Deploy</strong>—Enables Inventory Tracking. The ElectricCommander server tracks the artifacts deployed to environments.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Undeploy</strong>—The next time that the process is run, the ElectricCommander server removes information about the artifacts deployed to environments.</td>
</tr>
<tr>
<td></td>
<td>- <strong>Other</strong>—Disables Inventory Tracking.</td>
</tr>
</tbody>
</table>
### Field Description and How to Set It

<table>
<thead>
<tr>
<th>Field</th>
<th>Description and How to Set It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credential</td>
<td>An object consisting of a user name and password that ElectricFlow uses to run a process step.  &lt;br&gt;The dialog box displays the number of credentials for the process step, which are the same credentials that you use with procedures, steps, and schedules in the ElectricCommander platform.  &lt;br&gt;You can only impersonate one credential. To set the process type, see Adding Credentials.</td>
</tr>
<tr>
<td>Workspace</td>
<td>Area in the disk space where the files and results of the job step are stored.  &lt;br&gt;To set the workspace, click the <strong>Workspace</strong> field to open a drop-down list of workspaces in the ElectricCloud platform and select a workspace.  &lt;br&gt;For more information about workspaces, go to the ElectricCommander Help &gt; Workspaces and Disk Management. To set the workspace, click <strong>Workspace</strong> to open a drop-down list of workspaces in the ElectricCloud platform. Select a workspace, and click <strong>OK</strong>.</td>
</tr>
<tr>
<td>Time limit</td>
<td>Maximum length of time that the step is allowed to run. After the time specified, the step is aborted.  &lt;br&gt;To set the time limit, enter the time and select the unit of time: seconds, minutes, or hours.  &lt;br&gt;For information about time limits for procedure job steps in the ElectricCommander platform, go to the ElectricCommander Help &gt; API Commands.</td>
</tr>
</tbody>
</table>

**Example:**
3. (Optional) To add credentials, do the following:

**Example:**

1. Click in the Add Credentials field.

2. To impersonate one credential, select **Impersonate** in the Type field.

3. Click the Select Credential field to open a drop-down list of credentials for the process step.

4. Select a credential.

5. Click **OK**.

   The Credentials dialog box now shows the one credential for impersonation.

6. To attach one or more credential to the process step, select **Attach** in the Type field.

7. Click the Select Credential field to open a drop-down list of credentials for the process step.

8. Select a credential.

9. Click **OK**.

   The Credentials dialog box now shows the attached credentials.

4. Click **OK**.

   The Component Process Visual Editor opens.

**IMPORTANT:**

When you impersonate a credential, make sure that the impersonated user has the absolute path to the bin directories in the $PATH environment.

If you define a process step with a command, you must enter the absolute path in the Post Processor and Shell fields in the Define Step dialog box.
5. In the new process step, click the button below "Define this Step" to define it.

**Example:**

![Diagram](image)

The Component Process Step dialog box opens.

6. Enter information about the step in the dialog box.

**Example:**

![Component Process Step dialog box](image)
7. Click **Next**.

The Process Step dialog box opens.

**Example:**
8. To define the step, enter information in the dialog boxes that follow.

**Examples:**

![Edit Step dialog box](image1)

![Define Step dialog box](image2)

When you are done, the defined step now appears in the process in the Component Process Visual Editor.
9. Define more steps in the process.

You can also drag and drop a step into the process.

**Example:**

![Diagram of a process with steps](image1)

### Modeling More Component Processes

Repeat the steps in the previous section to add additional component processes.

**Example:**

![Diagram of a process with steps](image2)

### Modeling Application Processes

Starting in the Applications Visual Editor:

1. Click the **Add process** button in the upper right corner to add an application process.

**Example:**

![Diagram of an application process](image3)
The **New Application Process Details** dialog box opens.
2. Enter information in the New Application Process Details dialog box, and click **OK**.

**Example:**

![New Application Process Details dialog box](image)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description and How to Set It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Name of the process step</td>
</tr>
<tr>
<td>Description</td>
<td>Description of the process step</td>
</tr>
</tbody>
</table>
| Credential | An object consisting of a user name and password that ElectricFlow uses to run a process step.  

The dialog box displays the number of credentials for the process step, which are the same credentials that you use with procedures, steps, and schedules in the ElectricCommander platform.

You can only impersonate one credential.
<table>
<thead>
<tr>
<th>Field</th>
<th>Description and How to Set It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workspace</td>
<td>Area in the disk space where the files and results of the job step are stored. To set the workspace, click the <code>Workspace</code> field to open a drop-down list of workspaces in the ElectricCommander platform and select a workspace. For more information about workspaces, go to the ElectricCommander Help &gt; Workspaces and Disk Management. To set the workspace, click Workspace to open a drop-down list of workspaces in the ElectricCommander platform, select a workspace, and click OK.</td>
</tr>
<tr>
<td>Time limit</td>
<td>Maximum length of time that the step is allowed to run. After the time specified, the step is aborted. To set the time limit, enter the time and select the unit of time: seconds, minutes, or hours. For information about time limits for procedure job steps in the ElectricCommander platform, go to the ElectricCommander Help &gt; API Commands.</td>
</tr>
</tbody>
</table>
3. (Optional) To add credentials, do the following:

   **Note:**
   When you impersonate a credential, make sure that the impersonated user has the absolute path to the bin directories in the $PATH environment.
   If you define a process step with a command, you must enter the absolute path in the Post Processor and Shell fields in the Define Step dialog box.

   1. Click in the Add Credentials field.

      **Example:**

      ![Add Credentials](image)

   2. To impersonate one credential, select **Impersonate** in the Type field.

   3. Click the Select Credential field to open a drop-down list of credentials for the process step.

   4. Select a credential.

   5. Click **OK**.

      The Credentials dialog box now shows the one credential for impersonation.

   6. To attach one or more credential to the process step, select **Attach** in the Type field.

   7. Click the Select Credential field to open a drop-down list of credentials for the process step.

   8. Select a credential.

   9. Click **OK**.

      The Credentials dialog box now shows the attached credentials.

4. Click **OK**.

   The Applications Process Visual Editor opens.
5. In the new process step, click the button below "Define this Step" to define it.

**Example:**

![Diagram](image)

The Application Process Step dialog box opens.

6. Enter information about the step in the dialog box.

**Example**

```
<table>
<thead>
<tr>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Process Details</td>
</tr>
<tr>
<td>Description</td>
</tr>
<tr>
<td>Credential</td>
</tr>
<tr>
<td>Optional</td>
</tr>
<tr>
<td>Workspace</td>
</tr>
<tr>
<td>Optional</td>
</tr>
<tr>
<td>Time Limit</td>
</tr>
<tr>
<td>Optional</td>
</tr>
</tbody>
</table>
```

[OK] [Cancel]
7. Click **Next**.

The Process Step dialog box opens.

**Example:**
8. To define the step, enter information in the dialog boxes that follow.

**Example:**

![Application Process Step dialog box](image1)

![Define Step dialog box](image2)
9. When you are done, the defined step now appears in the process in the Applications Process Visual Editor.

**Example:**

![Diagram of a process flow]

10. Define more steps in the process.

   You can also drag and drop a step into the process.

**Modeling More Application Processes**

Repeat the steps in the previous section to add additional application processes.

**Using the Drag and Drop Method to Add Process Steps**

**How to get to the Application Process Visual Editor:**

- In an existing application process:

  From the Applications Visual Editor, click the down arrow next to the number-of-application-processes button and select an application.

  The Application Process Visual Editor for that application process appears.

- In a new application process:

  From the Applications Visual Editor, click the **Add process** button, set the parameters in the Application Process Details dialog box, and click **OK**.

  The Application Process Visual Editor for the application appears.

**How to get to the Component Process Visual Editor:**

- In an existing component process:

  From the Applications Visual Editor, click the down arrow next to the number-of-component-processes button in a component, and select a component process in the drop-down list.

  The Component Process Visual Editor for that component process appears.
In a new component process:

From the Applications Visual Editor, click the **Add process** button in a component, set the parameters in the **Component Process Details** dialog box, and click **OK**.

The Component Process Visual Editor for the component process appears.

To drag and drop a new step in a component or application process:

1. Click the **Add step** button in the upper right corner of the Component Process Visual Editor or Application Process Visual Editor.

   A new undefined step appears.

2. Select the new step.
3. Drag the step to where you want to add it in the process.

When you are near where you want to add the step in the process, notice that the icon changes shape and the text in it changes to "Dropping this Step in the Process."

4. Drop the step in the process.

The **Component Process Step** dialog box appears.
5. Enter information about the step.

The new step is in the process.

**Setting Parameters for Application Processes**

Starting in the Application Process Visual Editor:
1. Click the **Menu** button.

2. Click **Parameters**.

   **Example:**

   ![Diagram showing the process of clicking the Menu button and then Parameters]

   The **Parameters** dialog box opens.

   **Example:**

   ![Parameters dialog box with a message indicating there are no parameters yet]
3. Click There are no Parameters yet. Add one +.

The New Parameter dialog box opens.

Example:

![New Parameter dialog box]

4. Enter the following information:

- **Parameter Name**—Name of the parameter.
- **Description**—This is optional.
- **Parameter Label**—This is optional.
- **Select Parameter**—Parameter type
  - If the parameter is required, select the **Required** check box.
  - If the parameter value contains $[ ]$ and you want ElectricFlow to interpret it literally (not as a parameter reference), select the **Defer Expansion** check box.

Depending on the parameter type that you select, other fields appear in the **New Parameters** dialog box.
5. Enter information in the fields in Step 4.

    If you select Text Entry as the parameter type, the Default Value field appears.

    a. (Optional) Enter a value in the Default Value field.

        You do not have to enter a value in this field.

        **Example:**

        ![Parameter dialog box](image)

        b. Click OK.

        The Parameters dialog box opens and shows the new parameter in the list.

        **Example:**

        ![Parameter list](image)

6. Click Add + to add a parameter.
7. Enter information in the fields in Step 4.

   If you select **Text Area** as the parameter type, the **Default Value** field appears.

   a. (Optional) Enter a value in the **Default Value** field.
   
      You do not have to enter a value in this field.

   b. Enter the Click **OK**.

   **Example:**

   The **Parameters** dialog box opens and shows the new parameter in the list.
8. Enter information in the fields in Step 4. If you select **Dropdown Menu** as the parameter type, the **Default Value** field and ways to add the menu options appear.

   a. (Optional) Enter a value in the **Default Value** field.
      
      You do not have to enter a value in this field.

   b. On the right side of the dialog box, enter the menu options.

   c. Click **OK**.

      The **Parameters** dialog box opens and shows the new parameter in the list.

      **Example:**

      ![Parameters dialog box example]

      The **Parameters** dialog box opens and shows the new parameter in the list.
   
   If you select **Radio Selector** as the parameter type, the **Default Value** field and ways to add the menu options appear.
   
   a. (Optional) Enter a value in the **Default Value** field.
      
      You do not have to enter a value in this field.
   
   b. On the right side of the dialog box, enter the menu options.
   
   c. Click **OK**.

**Example:**

![Parameters dialog box](image)

The **Parameters** dialog box opens and shows the new parameter in the list.
10. Enter information in the fields in Step 4.

If you select **Checkbox** as the parameter type, the **Default Value** field and values for the check box appear.

a. *(Optional)* Enter a value in the **Default Value** field.
   
   You do not have to enter a value in this field.

b. On the right side of the dialog box, enter the values.

c. Click **OK**.

**Example:**

![Parameters dialog box example](image)

The **Parameters** dialog box opens and shows the new parameter in the list.
11. Enter information in the fields in Step 4. If you select **Credentials** as the parameter type, the **Default Value** field appears.

   a. (Optional) Enter a value in the **Default Value** field.
   
   You do not have to enter a value in this field.

   b. Click **OK**.

   **Example:**

   ![Parameters dialog box](image)

   The **Parameters** dialog box opens and shows the new parameter in the list.

   **Example:**

   ![Parameters list](image)

   **Setting and Modifying the Parameter Label**

   Starting in the **New Parameter** dialog box:

   **Example:**
1. Add a label in the **Label**.

**Example:**

![Diagram of parameter configuration]

This is an optional task when you set parameters.

If you enter a label, it appears in the UI form when you deploy the application. If you do not enter a label, the parameter name appears in the UI form when you deploy the application.

2. Click **OK**.
3. To modify the label:
   a. Open the **New Parameter** dialog box.
   b. Clear the **Label** field.
   c. Enter a new label.

   **Example:**

   ![New Parameter Dialog Box](image)

   d. Click **OK** to save the change.
4. To delete the label:
   a. Click **Delete** next to the **Label** field.

   Example:
b. Click in the **Label** field.

The label disappears.

**Example:**

![Parameters dialog box](image)

```
Example:
```

c. Click **OK**.

The **Parameters** dialog box opens. The parameter name now appears in the name column.

**Example:**

![Parameter list](image)

```
Example:
```
Looking Up Parameters

To apply parameters to an application or component process step, starting in the Application Process Visual Editor:

1. Add a new step to the process.

   **Example:**

   ![Diagram](image1)

2. Define the process step in the **Define Step** dialog box.

   **Example:**

   ![Dialog Box](image2)
3. When you define the process step with a plugin (Plugins), command or script (Command), or project (Procedure), click the **Lookup** button to open the **Parameter Lookup** dialog box.

**Example:**

The **Parameter Lookup** dialog box opens.

![Parameter Lookup dialog box](image)

4. Choose a parameter and click the **Copy** button to copy the path reference.
   
   A message appears in the row: `<Parameter Name>` has been copied.
   
   The **Define Step** dialog box now has a Parameter field.

5. Click in the Parameter field and paste the path reference that you copied in it.

6. Repeat the previous two steps to apply another parameter to the process step.

7. Click **OK**.

**Adding Credentials**

**How to get here:** From the Component Process Step or the Application Process Step dialog box, click >. The Credentials dialog box opens.

You can attach one or more credentials to component process steps and application process steps.

You attach only one credential for impersonation on the following:

- Component process
- Component process step
- Application process
- Application process step
IMPORTANT:
When you impersonate a credential, make sure that the impersonated user has the absolute path to the bin directories in the $PATH environment.
If you define a process step with a command, you must enter the absolute path in the Post Processor and Shell fields in the Define Step dialog box.

1. Click in the Add Credentials field.

   Example:

   ![Credentials dialog box with Impersonate option]

2. To impersonate one credential, select Impersonate in the Type field.
3. Click the Select Credential field to open a drop-down list of credentials for the process step.
4. Select a credential.
5. Click OK.
   The Credentials dialog box now shows the one credential for impersonation.
6. To attach one or more credential to the process step, select Attach in the Type field.
7. Click the Select Credential field to open a drop-down list of credentials for the process step.
8. Select a credential.
9. Click OK.
   The Credentials dialog box now shows the attached credentials.

Using Plugins

When you want to use a plugin to define your application or component process step, all of the supported plugins appear in the Plugin Manager in the Currently Installed tab in the ElectricCommander automation platform. However, you may want to see only the list of plugins that apply to your group or organization, such as Apache Subversion (SVN) and Git plugins. You can remove any plugins that you are not using from the Currently Installed tab. You can re-install them later if you need them.

To remove plugins from the Currently Installed tab:
1. In the Home page, click the **Main menu** button and then click **Admin > Plugins**.

   The Plugin Manager opens.

2. In the **Currently Installed** tab, select a plugin in the list.

3. In the Actions column for the selected plugin, click **Demote**.

   The page refreshes.

   The plugin is now inactive but is still in the list. If you want to use this plugin, click **Promote** to make it active.

4. If you want to remove the plugin from this list, click **Uninstall** to remove it from your system.

   For more details, go to the ElectricCommander Help > Web Interface Help > Plugin Manager. This page describes what you can do in the Plugin Manager, including how to install a new version of a plugin or add a new plugin.

You can see all of the plugins available from Electric Cloud in the **View Catalog** tab on the Administration > Plugins page. To show a list of plugins that you can install directly from Electric Cloud, do the following:

   1. Click **Install** in the **Action** column.
   2. Go to the **Currently Installed** tab.
   3. Choose a plugin and click **Promote**.

   The new plugin is now available for use in your system.

**Setting Email Notifications**

Review these guidelines before setting notifications:

New email notifications are disabled in the application, its application processes, and the process steps before you configure them.
You configure notifications in the "Application notifications / edit" dialog box.

**IMPORTANT:** The first time that you set notifications in this dialog box, the Notifications toggle changes to **On**. After you enter notification settings and click **OK**, email notifications are enabled at that level.

Go to Application Notifications Dialog Box on page 73 for information about how to use the "Application notifications" and "Application notifications /edit" dialog boxes.

By default, the application expects that the user creates an email configuration called "default." The email configuration defaults to the server property /server/ec_deploy/ec_defaultEmailConfiguration, which is set to 'default'.

If you want to use a different name for the email configuration, change the value of /server/ec_deploy/ec_defaultEmailConfiguration to the new email configuration name.

Starting from the Home page, to set email notifications:

1. Go to the Applications List.

**Example:**
2. Select an application.

   The Applications Visual Editor opens.

   **Example:**

   ![Applications Visual Editor](image1)

3. Click the **Menu** button.

   **Example:**

   ![Menu Button](image2)

   The Applications menu opens.

   **Example:**

   ![Applications Menu](image3)
4. Click **Notifications** to add a new application.

**Example:**

The Application notification dialog box opens.

**Example:**

![Application notifications dialog box](image)
5. Configure email notifications for the application, an application process, or a process step.

You can configure one or more notifications in an application process or other object.

**Configuring recipients**

In the **Who** field, you add users or groups who are configured and managed in the ElectricCommander platform or email addresses.

When you start typing a user name, group name, or email addresses, a list of names or email addresses appear that match what you are typing.

**Example:**

![Application notifications / edit](image)

If one of the suggestions matches the name or email address, select it, or continue typing. You can add more than one name or email address.

**Example:**

![Application notifications / edit](image)
Configuring the event that triggers the notification

In the **When** field, you select the event that triggers a notification to be sent to the recipients in the **Who** field. The default is **Both Failed and Successful**. Click in the **When** field to select the event for the notification.

**Example:**

![Image of application notifications editing screen]

Configuring the environments where the notification applies

In the **Where** field, you select the environments to which the notifications apply. Click in the **Where** field to select the environments, which are the environments to which the application is mapped in the tier map.

**Example:**

![Image of application notifications editing screen]

6. Select and edit the email notification message.
7. Add another notification for the the application, an application process, or a process step.

Click the **Add Notifications** button to add a new notification.

**Example:**

![Add Notifications button](image)

After you have added your email notifications, click **OK** to save the settings and return to the Application notifications dialog box.

**Example:**

![Application notifications window](image)
8. (Optional) Enable email notifications for the application, application processes, or process steps that are not already enabled.

To enable email notifications at the application level:

- Click the Notifications toggle and change it to **On**.

  The status of the application changes to **On**.

  **Example:**

  ![Application notifications](image1)

- Click the **Edit** button to open the Application notifications / edit dialog box.

  The Application notifications / edit dialog box appears. The Notification toggle changes to **On**.

  **Example:**

  ![Application notifications / edit](image2)

To enable notifications at the application process and process step levels, go to the Application Notifications / edit dialog box for the specific process or process step.

The dialog box opens, and the Notifications toggle is now **On**.

**Example:**
When you enter notification settings in the dialog box and click OK, the settings are saved. The Application notifications dialog box appears and now shows that the application process status is On.

**Example:**

![Application notifications dialog box](image)

---

**Selecting and Editing Email Messages**

Starting in the "Application notifications / edit" dialog box:

1. Click the **Template** button.

   A drop-down box opens.

   **Example:**

![Application notifications / edit dialog box](image)
2. Click the down arrow to open the list of email message templates that can apply to the application.
3. Select a template.

**Example:**

If the template is the current template applied to notification, the name of the template appears in dialog box.

**Example:**

If the template is not the current template, the Apply and Edit buttons appear in the dialog box.

**Example:**
4. If you want to use the template that you selected instead of the current one and do not want to change it, skip the remaining steps in this task.

5. If you want to apply a different template or edit the template that you selected, do the remaining steps in this task.

   If you click Apply to use the template as is, skip the remaining steps.

   If you click Edit to modify the template to fit your needs, go to the next step.

   The Email Message Preview dialog box appears.

   **Example:**
6. To edit the template:

   Change the name of the template in the Name field.
   Change the subject of the email in the Email subject line.
   To modify the body of the email message, click Edit HTML and edit the HTML code.

   **Example:**

   ![Email Message Preview](image)

   7. Click Preview.

   8. To save your changes:

      - Click Save Changes to save the change in an existing template
      - Click Save as New to save the template as a new template.

   The "Application notifications / edit" dialog box re-appears.
9. Click the down arrow to open the list of email message templates that can apply to the application.

The new email message template is in the list.

**Example:**

![Application notifications / edit](image)

10. Click **OK** to save the settings.

**Component and Application Process Steps: ectool Example**

This sample code shows how to design component and application process steps using the ectool API.

```bash
#!/bin/bash

# set all names
hostname='localhost'
projectName='default'
appName='myApp'
envName='myEnv'
appTierName='myAppTier'
componentName='myComponent'
artifactName='DEV:MyArt001'
```
envTierName='myEnvTier'
artifactProjectName='EC-Artifact-1.0.9.76076'
subProject_artifact='/plugins/EC-Artifact/project'
appProcessName='myApp_process'
appProcessStepName='myApp_process_step'
compProcessName='myComp_process'
compProcessStepName='myComp_process_step'
resrc1='res_1'
resrc2='res_2'
resrc3='res_3'
resrc4='res_4'

# login
ectool --server $hostname login admin changeme

# make sure same application, artifacts, resources don't already exist
echo 'make sure same application, artifacts, resources do not already exist'
ectool deleteApplication --projectName $projectName --applicationName $appName
ectool deleteEnvironment --projectName $projectName --environmentName $envName
ectool deleteArtifact --artifactName $artifactName
ectool deleteResource --resourceName $resrc1
ectool deleteResource --resourceName $resrc2
ectool deleteResource --resourceName $resrc3
ectool deleteResource --resourceName $resrc4

# create application
echo 'creating application'
ectool createApplication --projectName $projectName --applicationName $appName

# create application tier
echo 'creating application tier'
ectool createApplicationTier --projectName $projectName --applicationName $appName --applicationTierName $appTierName
#create and publish artifact versions

ectool createArtifact --groupId 'DEV' --artifactKey 'MyArt001'
ectool publishArtifactVersion --artifactName $artifactName --version '1.0' --fromDirectory 'tmp/partial_deployment' --includePatterns "abc1.war"
ectool publishArtifactVersion --artifactName $artifactName --version '2.0' --fromDirectory 'tmp/partial_deployment' --includePatterns "abc2.war"

#create component and add it to app tier

ectool createComponent --projectName $projectName --applicationName $appName --componentName $componentName --pluginName $artifactProjectName

ectool addComponentToApplicationTier --projectName $projectName --applicationName $appName --componentName $componentName --applicationTierName $appTierName

ectool createProcess --projectName $projectName --processName $compProcessName --componentName $componentName --processApplicationName $appName --processType "DEPLOY" --applicationName $applicationName

ectool createProcessStep --projectName $projectName --processName $compProcessName --processStepName $compProcessStepName --applicationName $applicationName --componentName $componentName

Modeling and Deploying Applications in Static Environments

```bash
e $appName --subprocedure 'Retrieve' --subproject $subProject_artifact --processStepType 'component' --includeCompParameterRef 1

# create environment, tiers and add resources
ectool createEnvironment --projectName $projectName --environmentName $envName --environmentEnabled 'true'

ectool createEnvironmentTier --projectName $projectName --environmentName $envName --environmentTierName $envTierName

ectool createResource --resourceName $resource1 --hostName $hostname --pools $projectName

ectool createResource --resourceName $resource2 --hostName $hostname --pools $projectName

ectool createResource --resourceName $resource3 --hostName $hostname --pools $projectName

ectool createResource --resourceName $resource4 --hostName $hostname --pools $projectName

ectool addResourceToEnvironmentTier --resourceName $resource1 --projectName $projectName --environmentName $envName --environmentTierName $envTierName

ectool addResourceToEnvironmentTier --resourceName $resource2 --projectName $projectName --environmentName $envName --environmentTierName $envTierName

ectool addResourceToEnvironmentTier --resourceName $resource3 --projectName $projectName --environmentName $envName --environmentTierName $envTierName

ectool addResourceToEnvironmentTier --resourceName $resource4 --projectName $projectName --environmentName $envName --environmentTierName $envTierName

# create application process and steps
ectool createProcess --projectName $projectName --processName $appProcessName --applicationName $appName

ectool createProcessStep --projectName $projectName --processName $appProcessName --processStepName $appProcessStepName --errorHandling 'abortJob' --subcomponent $componentName --subcomponentApplicationName $appName --subcomponentProcess $compProcessName --applicationTierName $appTierName --processStepType 'process'

# create tier mapping
ectool createTierMap --projectName $projectName --applicationName $appName --environmentProjectName $projectName --environmentName $envName --tierMapName 'map1' --tierMapping "$appTierName=$envTierName"
```

**Modeling Environments**
1. Add an environment and environment tiers.
2. Assign resources to environment tiers.

**Adding an Environment**

Starting from the Home page:

1. Go to the Environments List by either
   - Clicking the **Environments** launch pad.
   - Clicking the **Menu** button > **Environments**.

The Environments List opens.
2. Click the Add + button in the upper right corner.

   **Example:**

   ![Add Button](image)

   The New dialog box appears.

   **Example:**

   ![New Dialog Box](image)

3. Click Environment to create a static environment.

   The New Environment dialog box appears.

   **Example:**

   ![New Environment Dialog Box](image)

   There are two ways to add an environment:

   - Click **Create new environment** to create a environment. Go to the next step.
   - Click **Create from application** to create an environment based on an application.

   ElectricFlow adds an environment that has the tiers with the same names as the application you select.

4. Click **Create new environment**. The New dialog box opens.
5. Enter a name in the Name field.
6. (Optional) Enter a description of the environment in the Description field.
7. Click **OK**.

The Environments Visual Editor opens.

If you are modeling a new environment, the Environments Visual Editor displays an environment tier called Tier 1 with no assigned resources.

**Example:**

![Environments Visual Editor](image)

### Assigning Resources to Environment Tiers

Starting in the Environments Visual Editor:

1. Click the **Edit** button.

   The **Environment Tier Details** dialog box opens.

2. Change the name of the tier and click **OK**.

   **Example:**

   Change the name to **Apache** and click **OK**.

   The Applications Visual Editor now has an application tier called hello_world-env.

3. Click the + button in the new environment tier to add a resource.

   The **New** dialog box opens.

   **Example:**

   ![New dialog box](image)

4. Click **Add resources**.

   The resource list appears.
5. Select an available resource and click **OK**.

**Example:**

![Resource selection example](image1)

The Environments Visual Editor now shows an environment tier called Apache with one resource.

**Example:**

![Environment tier example](image2)

6. To add another resource to the same tier, click the **Add resource** button and repeat the previous steps starting with Step 3.
Making Tier Maps

Starting in the Home page:
1. Go to the Applications List.
2. Select the application that you want to run.
   The Applications Visual Editor opens.
3. Click the Add tier map button.

   **Example:**

   ![Add tier map button]

   The Tier Map dialog box opens.
4. Select an environment to which you want to map the application.

**Example:**
Select hello_world-env.

The `<Environment Name>/Tier Map` dialog box opens.

5. Choose an application tier, and click on the button in the Environment Tiers column.

A list of environment tiers in the environment that you selected appears.

**Example:**

6. Select a tier.

7. If an application has more than one application tier, repeat the previous steps to map the application tiers to environment tiers.

8. After you map all the application tiers to environment tiers, click **OK**.

**Example:**
To verify that the application is ready to run, go to the Applications List. When the Run process button is green, you can deploy (run) the application.

**Deploying (Running) Applications**

*Note:* Within ElectricFlow, the terms deploy and run are synonymous. When deploying an application in ElectricFlow, you are actually running it to produce your software or application.
Overview

You can deploy (run) an application one of these ways:
- **Smart deploy**
  The system deploys the application only with artifacts that have not been deployed to a resource or selected versions of the artifact have not been deployed to new resources since a previous run.

- **Full run**
  The system runs the application with all the application processes, components, and artifacts in the application.

- **Partial run**
  The system runs the application with only the selected application processes, components, and artifacts in the application.

- **Selecting artifacts with specific versions to run**
  The system runs the application with only the selected versions of the artifacts.

- **Snapshot**
  The system deploys a snapshot of the application.

- **A combination of the previous ways.**

These are possible combinations to deploy an application:

<table>
<thead>
<tr>
<th></th>
<th>Smart Deploy</th>
<th>Full Run</th>
<th>Partial Run</th>
<th>Artifacts with Specific Versions</th>
<th>Snapshot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart Deploy</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Full Run</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Partial Run</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Artifacts with Specific Versions</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Snapshot</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>n/a</td>
</tr>
</tbody>
</table>

You can view the results in the Application Inventory and the Environment Inventory.

**Deploying an Application**

Starting in the Home page:
1. Go to the Applications List.

   **Example:**
2. Choose an application and click the **Run process** button.
   
   A menu appears.
   
   **Example:**
   
   ![Example Menu](image)

   If this is the first time that you are running the application, the menu has only the **New Run** and **Schedule** options.

   3. To specify how you want to deploy (run) the application, select one of these options:

   - **New run**—Set the parameters as described in *Running Applications with New Parameters*.
     
     The **New <Application name>** dialog box opens.

   - **Last run**—Use the parameters from a previous run. You can modify one or more of these parameters as described in *Running Applications with Parameters from Previous Runs*.
     
     The **Edit <Application name>** dialog box opens.

   - **Schedule**—Set the application to run on a schedule as described in *Running Applications with Schedules*.

**Deploying Applications with Parameters from Previous Runs**

When you use the **Last Run** option, you configure how to run the application based on parameters from a previous run.

   1. Go to the Applications List.

   **Example:**
2. Choose an application and click the **Run process** button.
   
   A menu appears.

   **Example:**

   ![Example Menu](image)

3. Select **Last Run** to use the parameters from previously run application.

   A list of applications appears.
4. Select a previous run.

The dialog box to set the parameters for running the application opens.

**Example:**

This example is not part of the hello_world-env deployment. It shows only the deployment for Store 1.2 is a Partial Run.

5. Select the application process.

6. Select an environment.
7. (Optional) Select a snapshot.

If this is the first time that you are running the application, smart deploy is not enabled.

**Example:**

This example is not part of the hello_world-env deployment. It shows only that there are five snapshots.
8. To select and configure the **Full Run** option:
   a. Click **Full Run**.

   A dialog box opens showing the objects in the application.

   This example shows that all of the objects, application tiers, components, and artifacts, are selected.

   **Example:**

   This example is not part of the hello_world-env deployment. It shows only that the all objects are selected for the Full Run.
b. Click **OK**.

The dialog box re-appears.

**Example:**
This example is not part of the hello_world-env deployment. It shows only that one of two artifacts will be deployed.

9. To select and configure the **Partial Run** option:
   
a. Click **Partial Run**.
      
      A dialog box opens showing the objects in the application.
   
b. Determine the objects in the application that you do not want to run and click the each row to remove them from the run.
   
c. Click **OK**.
10. To select artifacts with specific versions:
   a. Click **Selected Artifacts**.
      
      A dialog box opens showing the objects in the application. The version of each component is in the Version column. The current version of all the components is Latest, the latest version of the component.
      
      **Example:**
      
      This example is not part of the hello_world-env deployment. It shows how to select specific artifacts to deploy.
      
      ![Diagram](image)
      
      b. To change the version of a component, click the down arrow next to current version.
         
         A drop-down menu appears.
      
      c. Select the version that you want the application to run.
      
      d. Click **OK**.
         
         The dialog box re-appears.
11. Click **OK** to run the application.

**Example:**

This example shows one way to deploy the `hello_world-app` application.

You can view the results in the Application Inventory and the Environment Inventory. For more information, go to Viewing Results and Troubleshooting.

### Deploying (Running) Applications with Schedules

When you use the **Schedule** option, you set the day and time when the application runs.

1. Go to the Applications List.

**Example:**
2. Choose an application and click the **Run process** button.

A menu appears.

**Example:**

![Menu Example](image-url)
3. Select **Schedule** to set the day and time when the application will run automatically.

The **Schedule** dialog box opens.

**Example:**

![Schedule dialog box](image)

- Click the **Add +** button in the upper right corner.

  **Example:**

  ![Add button](image)

  The **New Schedule** dialog box appears.

  **Example:**

  ![New Schedule dialog box](image)

  b. Select **New run** or **Previous run**.

     If this is the first time that you are running the application, select **New run** and go to the appropriate next step.

     If you select **Previous Run**, go to the appropriate next step.
c. Select **New run** to set a schedule for a new run, and enter a name for the schedule in the **New Schedule Details** dialog box.

**Example:**

The **New Schedule Details** dialog box opens.

d. Select **Previous run** to set a schedule used for a previous run, and select it in the **Schedule previous run** dialog box, which has information about the last five runs.

**Example:**
e. Enter the schedule name and click in the **Frequency** field to set how often the application runs.

**Example:**

![Image of Schedule Details]

Depending on the frequency that you select, different fields appear.

- **Once**—Enter information in the date (Month, Day, and Year) and the time (hours, minutes, and AM or PM) fields.
- **Daily**—Enter only the time (hours, minutes, and AM or PM).
- **Weekly**—Enter the **Day of week** (Monday to Sunday) and the time (hours, minutes, and AM or PM).
- **Monthly**—Enter the **Day** and the time (hours, minutes, and AM or PM).
f. Enter the appropriate information in the fields below the Frequency field.

Example:

For example, if you select **Daily**, set the time (hours, minutes, and **AM** or **PM**). In the time fields, click in it and enter the hours and minutes and then select **AM** or **PM**.

Example:
g. Click **Next**. The dialog box to set the parameters for running the application opens.

4. Select an application process.

5. Select an environment.

   If this is the first time that you are running the application, smart deploy is not enabled.
6. Click **OK**.

   A message appears about when the application is run according to the schedule.

   **Example:**

   ![Example](image)

   When it is time for the application to run, the system runs it in the background.

   You can view the results in the Application Inventory and the Environment Inventory. For more information, go to [Viewing Results and Troubleshooting](#).

### Deploying Snapshots

1. Go to the Applications List.
2. Choose an application.
3. Click the **Run process** button.

   **Example:**

   ![Example](image)
4. Select **New Run, Last Run, or Schedule**.

The dialog box to set the parameters for running an application opens.

In this dialog box, you can deploy a snapshot or compare the application to the selected snapshot.

**Example:**

![Dialog box for setting parameters for running an application]

5. Select the parameters to run an application.

For more information, go to Deploying or Comparing Snapshots on page 418 and Deploying (Running) Applications on page 173.

**Example:**

![Dialog box with parameters for deploying or comparing a snapshot]

6. To run (deploy) the snapshot:

1. Click **OK**.
2. Go to Deploying (Running) Applications on page 173 for more information.
To compare the application to the selected snapshots:

1. Click **Compare** to compare the application to the selected snapshot.
2. Go to **Comparing Snapshots** on page 421.

You can compare the application to other snapshots.

**Deploying or Comparing Snapshots**

*How to get here:* From the Home page, go to the Applications List, choose an application, click the Run process button, and select **New Run**.

**Example:**

The dialog box to set the parameters for running (deploying) the application opens.

In this dialog box, you can deploy a snapshot or compare the application to a snapshot.

**Setting Parameters in the Dialog Box**

In the dialog box, the **Select a Snapshot** option is available (enabled) because the application has one or more snapshots saved.

**Example:**

Select the following options to set the parameters to run the application:

- **Select Process**—Click the pull-down button to select the application to run.
- **Select Environment**—Click the pull-down button to select the environment in which the application will run.
- **Select a Snapshot**—Click the pull-down button to select one or more snapshot.

The **Compare** option is now available (enabled) because of the following
- There are one or more snapshots that can be compared to the application in the selected environment.
- The application has been selected.
- The environment has been selected.
- The one or more snapshot has been selected.

**Example:**

![Example Diagram]

**Deploying Snapshots**

After setting the parameters, click **OK** to run (deploy) the selected snapshot.

For more information, go to

**Comparing Snapshots**

After setting the parameters, click **OK** to compare the selected application to a snapshot.

**Deploying Applications with Parameters**

Starting in the Applications List:

1. Choose the application that you want to deploy and click the **Run process** button.
2. Select **New Run** to deploy the application with new settings.
   
   The **New** dialog box opens.
3. Select the application process, environment, tier map, snapshot, artifact, and resource options, as described in other topics in this document.
4. In the **Parameters** row, click the button to open a form showing the parameters that apply to the application process.
5. Enter information in the fields.
6. Click **OK** to save the parameter settings and close the form.

   The **New** dialog box now shows what you set in the previous two steps.

   The Parameters row shows the number of required parameters. You must enter information for those parameters to deploy the application.

7. Click **OK** to deploy the application.

**Examples: Deploying (Running) Applications**

These examples show how to set the parameters for:

- **Full run**
  
  The system runs the application with all the application processes, components, and artifacts in the application.

- **Partial run**
  
  The system runs the application with only the selected application processes, components, and artifacts in the application.

- **Selecting artifacts with specific versions to run**
  
  The system runs the application with only the selected versions of the artifacts.

- **Combinations of these ways**

**Full Run**

In this example, **Full Run** is selected. All the objects in Store 1.2 will be deployed.

**Examples:**

To view what objects in the application will run, click **Full Run**.
A dialog box with a list of objects in the application opens. The objects that are selected with the green check mark will run.

**Example:**

![Image of a dialog box with a list of objects and check marks]

**Partial Runs with Specific Artifact Versions**

You can do a **Partial Run** to run only some of the objects.

To select an object that you do not want to deploy, click in its row.

For example, if you click in the Cookie row, all the objects in the Cookie are removed from the next run.

**Example:**

![Image of a dialog box with a list of objects and check marks]

After you click **OK**, the dialog box now shows that when the application runs, it is a **Partial Run** and that 1 of 2 artifacts in the application will run.

**Example:**
You can also select specific versions of artifacts.

To select the artifact versions, click in the row with Artifacts.

The dialog box opens.

**Example:**

The version of each artifact is in the Version column. The current version is *Latest*.

To see the actual version, click the down arrow next to the current version. A drop-down menu appears.

For the Backup1.zip component, the possible versions are in the drop-down list. The latest version is Version 2.0.

**Example:**
Click **OK** to save these settings and return to the dialog box.

**Viewing Results and Troubleshooting**
Viewing the Environment Inventory and Application Inventory

Follow these steps to get more information about the state of the environment at a point in time and to view information about an object during the deployment.

Starting at the Home page:

1. Go to the Environments List.
2. Choose an environment.
3. Click the **Inventory** button.

   **Example:**

   ![Image](image1.png)

   The Environment Inventory opens.

   **Example:**

   ![Image](image2.png)

4. Click the **View** button to view more information about the application.

   **Example:**

   ![Image](image3.png)

   Information about the components appears.

   **Example:**

   ![Image](image4.png)
5. Click the **Process** button to view more information.

**Example:**

![Gear icon]

The Application Inventory opens and displays details about the application processes, components, and process steps.

**Example:**

![Application Inventory screenshot]

**Note:** You can also go to the Application Inventory by going to the Applications List, clicking the **View** button to show the previous deployments, choosing a deployment, and clicking the **View Details** button.

6. Click the **View** buttons for the process steps to view more details.

**Example:**

![Application Inventory screenshot]

**Examples: Viewing Deployment Details**

The following are examples of the information that you can get about the objects in your deployment.

- The application is **hello_world-app**.
- The application process is Deploy, which has one application process step called **put html file**.
- The application process step calls a component process called Deploy, which has two steps: **get html files** and **copy to appache**.
- The "get html files" step runs on the resource called hello_world-web-server-resource.
- The "copy to apache" step runs on the resource called hello_world-web-server-resource.

This information can be used to understand what was deployed and where, how long it took to run the processes and process steps, the state of objects at a specific time, when the application was modified and how, and so on. This information is useful when you troubleshoot the application and are evaluating it to find ways to optimize and enhance it.

**Example 1: Application Process Level Details**

When you click the View Details button for 3_Deploy_hello_world-app, you go to the Job Details page for the application.

To get more information about Retrieve Artifact, click the View Log button.

**Example:**

The Job details appear.

**Example:**
Example 2: Application Process Step Level Details

When you click the View Details button for put html files, you go to the Job Details page for this job step. You can click the Job link in the General Information to view information about the job in the previous example.

Example 3: Component Process Step Details

When you click the View Details button for get html files, you go to the Job Details page for this job step. You can click the Job link in the General Information to view information about the job in the previous example.
Example 4: Change History of a Resource

When you click the Track Changes button for resource called `hello_world-web-server-resource`, you go to the Change History for Details page for the application process.

Running a New Search Through the Change History

Follow these steps to start a search through the Change History.

Starting from the Home page:
1. Click the **Search** button.

**Example:**

![Search button](image)

The **Change History - Search** dialog box opens.

**Example**

![Change History - Search dialog box](image)

2. Click the down arrow in the Time Increment field to open the drop-down list.

**Example:**

![Change History - Search dialog box with drop-down list](image)
3. (Optional) If you want to use a time increment longer than three days, do the following:
   a. Click **Select Date**.

   The Date Picker opens.

   **Example:**

   ![Date Picker Example]
b. Select a date.

**Example:**

The Date Picker closes and the date that you selected appears in the Time Increment field.

**Example:**
4. Click **Multiple Select** to open the drop-down list of tracked objects.

**Example:**
5. Select the objects to include in the Change History.

**Example:**

![Change History - Search](image1)

6. Enter the search criteria.

As you type, the system starts to search for objects that match your search criteria.

A list of objects matching your search criteria appears in the results section.

**Example:**

![Change History - Search](image2)
7. Select an object in the list.

Example:

The change history for the object that you selected appears.

Example:
Modeling and Deploying Applications in Dynamic Environments

Starting in ElectricFlow 5.4, you can model an application, deploy it in a dynamically created environment, and view and troubleshoot the results. In this workflow, you can create dynamic environments with cloud resources that are spun up when you deploy the application. It does not describe how to create static environments with resources in your system or network that are configured before deploying the application. For information about this workflow, go to Modeling and Deploying Applications in Static Environments on page 106.

A dynamic environment is an environment that is provisioned using an environment template. You can add provisioned cloud resources as well as static resources to an environment template. All of the following are considered to be dynamic environments:

- An environment with only provisioned cloud resources
- An environment with only static resources added to an environment template
- An environment with provisioned cloud resources and static resources.

Using dynamic environments, teams that use dynamic cloud resources to deploy applications can do the following:

- Define and provision dynamic cloud resources when deploying applications.
- Configure the middleware of dynamic cloud resources on an on-demand basis.
- Re-use resource pools.
- Track how provisioned cloud resources are used.
- Provide ways to optimize how cloud resources are used.
- Provide status of the process that provisions cloud resources.
- Verify the credentials of cloud resources before provisioning them.

The following tasks describe how to model and deploy (run) applications at a high level.

1. Logging in to ElectricFlow on page 212
2. Modeling Applications on page 213
3. Modeling Dynamic Environments on page 267
4. Deploying Applications With Provisioned Cloud Resources on page 321
5. Retiring Dynamic Environments on page 329

For information about the UI, go to ElectricFlow Buttons and Icons on page 15.
More about application, deploy, and run:

As you use ElectricFlow, remember that these terms have different meanings within ElectricFlow and outside of ElectricFlow when you deploy your software or application:
<table>
<thead>
<tr>
<th>Term</th>
<th>Within ElectricFlow</th>
<th>Outside of ElectricFlow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>The application that you design and run (deploy) to produce your software for continuous delivery across different pipelines.</td>
<td>The software, system or application that you build, test, install, implement, release, and deploy using ElectricFlow. This is the end product of using ElectricFlow.</td>
</tr>
<tr>
<td>Deploy</td>
<td>Running the application that you designed in ElectricFlow. The end product is your software, system, or application. Deploy is a synonym of run in ElectricFlow.</td>
<td>All the processes or actions to develop and run your software in its environment, including building, testing, implementing, installing, configuring, making changes, and releasing.</td>
</tr>
<tr>
<td>Run</td>
<td>Running the application that you designed. The end product is your software, system, or application. <em>Run is a synonym of deploy in ElectricFlow.</em></td>
<td>All the processes or actions to use software in its environment, including implementing, installing, configuring, debugging, troubleshooting, and releasing.</td>
</tr>
</tbody>
</table>

**Logging in to ElectricFlow**

1. Enter http://<commander-server>/flow in a browser window, where <commander-server> is the ElectricCommander server IP address or host name.

   For example, when you go to https://123.123.1.222/flow/, the landing page opens.

   **Example:**
IMPORTANT: For a new installation, the default admin account user name is admin and the password is changeme. You should change the default admin password as soon as possible.

2. Enter a user name and password.
3. Click Sign in.

   The ElectricFlow Home page opens.

**Modeling Applications**
1. Create an application and application tiers.
2. Add components to the application tiers.
3. Model component processes.
5. (Optional) Set email notifications and edit the email messages.

Creating an Application and Application Tiers

Starting from the Home page:
1. Go to the Applications List by either
   - Clicking the Applications launch pad.
   - Clicking the Menu button > Applications.
The Applications List opens.

2. Click the Add + button in the upper right corner.

**Example:**

![Add Button]

The New Application dialog box appears.

**Example:**

![New Application Dialog]

There are two ways to create an application:

- Click **Create new app** to create a new application.
- Click **Create from existing** to create an application based on an existing application.

3. Create the application by going to appropriate next step.

- To create a new application, go to **Creating a New Application** on page 216.
- To create an application based on an existing application, go to the next step.
4. Click **Create from existing** to create an application based on an existing one.

The new application will have the same objects (components, artifacts, and application processes) as the existing application. However, it is not an exact copy of it because you need to configure new tier maps for it.

The **New Application from Existing** dialog box opens.

   a. Select an application.
      
      The **New Application Name** dialog box opens with the name of the application you selected in the **Name** field.
   b. Enter a name in the **Name** field.
      
      It must not match the name of another application in the project.
   c. (Optional) Enter a description of the application in the **Description** field.
   d. Click **OK**.

If you are modeling an application based on an existing application, the Applications Visual Editor displays the same application tiers and components as the existing application with the name that you entered.

---

**Creating a New Application**

Starting in the Applications List:

1. Click the **Add +** button in the upper right corner.

   **Example:**

   ![Add button example](image)

   The New Application dialog box appears.

   **Example:**

   ![New Application dialog box example](image)
2. Click **Create new app** to create an application.

   The **New Application Name** dialog box opens.
   
   a. Enter a name in the **Name** field.
   
   b. (Optional) Enter a description of the application in the **Description** field.
   
   c. Click **OK** to save the settings.

   If you are modeling a new application, the Applications Visual Editor displays an application tier called Tier 1 with one component called Component.

   **Example:**

   ![Application Tier Design](image)

   3. Go to **Defining Components** on page 43 to set the component details.

**Adding Components to the Application Tiers**

Starting in the Applications Visual Editor:

1. Click the **Edit** button.

   The **Application Tier Details** dialog box opens.

2. Change the name of the tier and click **OK**.

   **Example:**

   Change the name to **Web Server** and click **OK**.

   The Applications Visual Editor now has an application tier called Web Server.

3. Click the + button in the component.

   The **New Component** dialog box opens.

4. Enter a name in the **Name** field.

5. (Optional) Enter a description of the component in the **Description** field.
6. Click **Next** to save the settings.
   The Component Details dialog box opens.

7. Click the **Current Location** field.
   A list of available artifact locations appears.

8. Select a location and click **Browse**.
   The information needed to define the artifact appears below.

9. Enter the appropriate information in the fields.

**Example:**

<table>
<thead>
<tr>
<th></th>
<th>Component Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Content Location of the component</td>
</tr>
<tr>
<td>2</td>
<td>Component details that vary depending on the Content Location</td>
</tr>
</tbody>
</table>
10. Click **OK**.

The Applications Visual Editor now shows an application tier called Web Server with a component called hello_world.

**Example:**

![Diagram of Web Server with hello_world component](image)

11. To add a component to the same tier, click the + button in the lower right corner of the tier.

A new undefined component appears in the tier.

12. Configure this component the same way you did the first one.

**Adding a Component**

To add component to the same application tier:

1. Click the + button in the lower right corner of the tier.

A new undefined component appears in the tier.

2. Click the + button in the new component to set the component details, following the steps previously described.

**Adding an Application Tier**

To add an application tier, click the **Add tier** button.

**Modeling Component Processes**

Starting in the Applications Visual Editor:

1. Click the **Add Process** button in a component to a component process to it.

**Example:**

![Diagram of process button](image)

The **New Component Process Details** dialog box opens.
2. Enter information about the component process in the Component Process Details dialog box.

Example:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description and How to Set It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Name of the process step</td>
</tr>
<tr>
<td>Description</td>
<td>Description of the process step</td>
</tr>
</tbody>
</table>
| Process Type | Type of process. The default is **Deploy**. To set the process type:  
1. Click the **Type** field to select the process type.  
2. Select one of these options:  
   - **Deploy**—Enables Inventory Tracking. The ElectricCommander server tracks the artifacts deployed to environments.  
   - **Undeploy**—The next time that the process is run, the ElectricCommander server removes information about the artifacts deployed to environments.  
   - **Other**—Disables Inventory Tracking. |
<table>
<thead>
<tr>
<th>Field</th>
<th>Description and How to Set It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credential</td>
<td>An object consisting of a user name and password that ElectricFlow uses to run a process step. The dialog box displays the number of credentials for the process step, which are the same credentials that you use with procedures, steps, and schedules in the ElectricCommander platform. You can only impersonate one credential. To set the process type, see <a href="#">Adding Credentials</a>.</td>
</tr>
<tr>
<td>Workspace</td>
<td>Area in the disk space where the files and results of the job step are stored. To set the workspace, click the <strong>Workspace</strong> field to open a drop-down list of workspaces in the ElectricCloud platform and select a workspace. For more information about workspaces, go to the <a href="#">ElectricCommander Help &gt; Workspaces and Disk Management</a>. To set the workspace, click <strong>Workspace</strong> to open a drop-down list of workspaces in the ElectricCloud platform. Select a workspace, and click <strong>OK</strong>.</td>
</tr>
<tr>
<td>Time limit</td>
<td>Maximum length of time that the step is allowed to run. After the time specified, the step is aborted. To set the time limit, enter the time and select the unit of time: seconds, minutes, or hours. For information about time limits for procedure job steps in the ElectricCommander platform, go to the <a href="#">ElectricCommander Help &gt; API Commands</a>.</td>
</tr>
</tbody>
</table>

**Example:**
## Component Process Details

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Deploy</td>
</tr>
<tr>
<td>Credential</td>
<td>0</td>
</tr>
<tr>
<td>Workspace</td>
<td></td>
</tr>
<tr>
<td>Time (and)</td>
<td>0 00:00:00</td>
</tr>
</tbody>
</table>

**Options:**
- Cancel
- OK
3. (Optional) To add credentials, do the following:

**IMPORTANT:**
When you impersonate a credential, make sure that the impersonated user has the absolute path to the bin directories in the $PATH environment.
If you define a process step with a command, you must enter the absolute path in the **Post Processor** and **Shell** fields in the Define Step dialog box.

1. Click in the **Add Credentials** field.

   **Example:**

   ![Add Credentials Example](image)

2. To impersonate one credential, select **Impersonate** in the **Type** field.
3. Click the **Select Credential** field to open a drop-down list of credentials for the process step.
4. Select a credential.
5. Click **OK**.

   The **Credentials** dialog box now shows the one credential for impersonation.

6. To attach one or more credential to the process step, select **Attach** in the **Type** field.
7. Click the **Select Credential** field to open a drop-down list of credentials for the process step.
8. Select a credential.
9. Click **OK**.

   The **Credentials** dialog box now shows the attached credentials.

4. Click **OK**.

   The Component Process Visual Editor opens.
5. In the new process step, click the button below "Define this Step" to define it.

**Example:**

![Image of process flow with arrow pointing to button labeled Define this Step]

The Component Process Step dialog box opens.

6. Enter information about the step in the dialog box.

**Example:**

![Image of Component Process Step dialog box with fields filled out]
7. Click **Next**.

The Process Step dialog box opens.

**Example:**
8. To define the step, enter information in the dialog boxes that follow.

**Examples:**

When you are done, the defined step now appears in the process in the Component Process Visual Editor.
9. Define more steps in the process.

You can also drag and drop a step into the process.

**Example:**

![Diagram](image)

**Modeling More Component Processes**

Repeat the steps in the previous section to add additional component processes.

**Example:**

![Diagram](image)

**Modeling Application Processes**

Starting in the Applications Visual Editor:

1. Click the **Add process** button in the upper right corner to add an application process.

**Example:**
The **New Application Process Details** dialog box opens.
2. Enter information in the New Application Process Details dialog box, and click **OK**.

**Example:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description and How to Set It</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Name of the process step</td>
</tr>
<tr>
<td>Description</td>
<td>Description of the process step</td>
</tr>
<tr>
<td>Credential</td>
<td>An object consisting of a user name and password that ElectricFlow uses to run a process step. The dialog box displays the number of credentials for the process step, which are the same credentials that you use with procedures, steps, and schedules in the ElectricCommander platform. You can only impersonate one credential.</td>
</tr>
<tr>
<td>Field</td>
<td>Description and How to Set It</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------</td>
</tr>
</tbody>
</table>
| Workspace   | Area in the disk space where the files and results of the job step are stored.  
To set the workspace, click the **Workspace** field to open a drop-down list of workspaces in the ElectricCommander platform and select a workspace.  
For more information about workspaces, go to the **ElectricCommander Help > Workspaces and Disk Management**.  
To set the workspace, click Workspace to open a drop-down list of workspaces in the ElectricCommander platform, select a workspace, and click **OK**. |
| Time limit  | Maximum length of time that the step is allowed to run. After the time specified, the step is aborted.  
To set the time limit, enter the time and select the unit of time: seconds, minutes, or hours.  
For information about time limits for procedure job steps in the ElectricCommander platform, go to the **ElectricCommander Help > API Commands**. |
3. (Optional) To add credentials, do the following:

   **Note:**
   When you impersonate a credential, make sure that the impersonated user has the absolute path to the bin directories in the $PATH environment.
   If you define a process step with a command, you must enter the absolute path in the Post Processor and Shell fields in the Define Step dialog box.

   1. Click in the **Add Credentials** field.

      **Example:**

      ![Add Credentials Example](image)

   2. To impersonate one credential, select **Impersonate** in the **Type** field.

   3. Click the **Select Credential** field to open a drop-down list of credentials for the process step.

   4. Select a credential.

   5. Click **OK**.

      The **Credentials** dialog box now shows the one credential for impersonation.

   6. To attach one or more credential to the process step, select **Attach** in the **Type** field.

   7. Click the **Select Credential** field to open a drop-down list of credentials for the process step.

   8. Select a credential.

   9. Click **OK**.

      The **Credentials** dialog box now shows the attached credentials.

4. Click **OK**.

   The Applications Process Visual Editor opens.
5. In the new process step, click the button below "Define this Step" to define it.

Example:

The Application Process Step dialog box opens.

6. Enter information about the step in the dialog box.

Example
7. Click **Next**.

The Process Step dialog box opens.

**Example:**
8. To define the step, enter information in the dialog boxes that follow.

Example:

![Dialog box for defining an application process step]

- **Step name**: put.html file
- **Tier**: Web Server
- **Credential**: None
- **Workspace**: 
- **Time limit**: 0 seconds

![Dialog box for defining on error handling]

- **On Error**: Stop running
- **Continue running**:
9. When you are done, the defined step now appears in the process in the Applications Process Visual Editor.

Example:

![Diagram showing a process flow with steps labeled as 'Deploy', 'Web', and 'Server'.]

10. Define more steps in the process.

You can also drag and drop a step into the process.

Modeling More Application Processes

Repeat the steps in the previous section to add additional application processes.

Using the Drag and Drop Method to Add Process Steps

How to get to the Application Process Visual Editor:

- In an existing application process:

  From the Applications Visual Editor, click the down arrow next to the number-of-application-processes button and select an application.

  The Application Process Visual Editor for that application process appears.

- In a new application process:

  From the Applications Visual Editor, click the Add process button, set the parameters in the Application Process Details dialog box, and click OK.

  The Application Process Visual Editor for the application appears.

How to get to the Component Process Visual Editor:

- In an existing component process:

  From the Applications Visual Editor, click the down arrow next to the number-of-component-processes button in a component, and select a component process in the drop-down list.

  The Component Process Visual Editor for that component process appears.
• In a new component process:

   From the Applications Visual Editor, click the Add process button in a component, set the parameters in the Component Process Details dialog box, and click OK.

   The Component Process Visual Editor for the component process appears.

To drag and drop a new step in a component or application process:

1. Click the Add step button in the upper right corner of the Component Process Visual Editor or Application Process Visual Editor.

   A new undefined step appears.

2. Select the new step.
3. Drag the step to where you want to add it in the process.

When you are near where you want to add the step in the process, notice that the icon changes shape and the text in it changes to "Dropping this Step in the Process."

4. Drop the step in the process.

The Component Process Step dialog box appears.
5. Enter information about the step.

The new step is in the process.

Setting Parameters for Application Processes

Starting in the Application Process Visual Editor:
1. Click the **Menu** button.
2. Click **Parameters**.

   **Example:**

   ![Diagram with Menu and Parameters selected]

   The **Parameters** dialog box opens.

   **Example:**

   ![Parameters dialog box with no parameters selected]
3. Click There are no Parameters yet. Add one +.

The New Parameter dialog box opens.

**Example:**

![New Parameter dialog box](image)

4. Enter the following information:

   - **Parameter Name**—Name of the parameter.
   - **Description**—This is optional.
   - **Parameter Label**—This is optional.
   - **Select Parameter**—Parameter type
     - If the parameter is required, select the **Required** check box.
     - If the parameter value contains `$[ ]` and you want ElectricFlow to interpret it literally (not as a parameter reference), select the **Defer Expansion** check box.

Depending on the parameter type that you select, other fields appear in the New Parameters dialog box.
5. Enter information in the fields in Step 4.

If you select Text Entry as the parameter type, the Default Value field appears.

a. (Optional) Enter a value in the Default Value field.

You do not have to enter a value in this field.

Example:

![Parameter dialog box](image)

b. Click OK.

The Parameters dialog box opens and shows the new parameter in the list.

Example:

![Parameters dialog box](image)

6. Click Add + to add a parameter.
7. Enter information in the fields in Step 4.

If you select Text Area as the parameter type, the Default Value field appears.

   a. (Optional) Enter a value in the Default Value field.

      You do not have to enter a value in this field.

   b. Enter the Click OK.

**Example:**

![Parameters dialog box](image)

The Parameters dialog box opens and shows the new parameter in the list.
8. Enter information in the fields in Step 4. If you select **Dropdown Menu** as the parameter type, the **Default Value** field and ways to add the menu options appear.

   a. (Optional) Enter a value in the **Default Value** field.

      You do not have to enter a value in this field.

   b. On the right side of the dialog box, enter the menu options.

   c. Click **OK**.

   The **Parameters** dialog box opens and shows the new parameter in the list.

   **Example:**

   ![Parameters Dialog Box](image)

   The **Parameters** dialog box opens and shows the new parameter in the list.
   If you select **Radio Selector** as the parameter type, the **Default Value** field and ways to add the menu options appear.
   a. (Optional) Enter a value in the **Default Value** field.
      You do not have to enter a value in this field.
   b. On the right side of the dialog box, enter the menu options.
   c. Click **OK**.

   **Example:**

   ![Parameters dialog box](image)

   The **Parameters** dialog box opens and shows the new parameter in the list.
10. Enter information in the fields in Step 4.

If you select **Checkbox** as the parameter type, the **Default Value** field and values for the check box appear.

a. (Optional) Enter a value in the **Default Value** field.

   You do not have to enter a value in this field.

b. On the right side of the dialog box, enter the values.

c. Click **OK**.

**Example:**

![Parameters dialog box](image)

The **Parameters** dialog box opens and shows the new parameter in the list.
11. Enter information in the fields in Step 4. If you select **Credentials** as the parameter type, the **Default Value** field appears.

   a. (Optional) Enter a value in the **Default Value** field. You do not have to enter a value in this field.

   b. Click **OK**.

   **Example:**

   ![Parameters dialog box](image)

   The **Parameters** dialog box opens and shows the new parameter in the list.

   **Example:**

   ![Parameters dialog box](image)

   **Setting and Modifying the Parameter Label**

   Starting in the **New Parameter** dialog box:

   **Example:**
1. Add a label in the **Label**.

   **Example:**

   ![Image of label input field]

   This is an optional task when you set parameters.

   If you enter a label, it appears in the UI form when you deploy the application. If you do not enter a label, the parameter name appears in the UI form when you deploy the application.

2. Click **OK**.
3. To modify the label:
   a. Open the **New Parameter** dialog box.
   b. Clear the **Label** field.
   c. Enter a new label.

**Example:**

![New Parameter dialog box with example changes](image)

   d. Click **OK** to save the change.
4. To delete the label:
   a. Click **Delete** next to the **Label** field.

   Example:
b. Click in the **Label** field.

The label disappears.

**Example:**

![Image of the Parameters dialog box]

- **Checkbox:**
- **Default Value:**

- **Required**
- **Default Expansion**

- **New Parameter:**
  - **Value when unchecked:**
    - **No**
  - **Value when checked:**
    - **Yes**
  - **Initially checked**

- **Cancel**
- **OK**

---

**Example:**

- **Click OK.**

The **Parameters** dialog box opens. The parameter name now appears in the name column.

**Example:**

<table>
<thead>
<tr>
<th>6 Parameters</th>
<th>Add</th>
<th>Delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deploy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Type</td>
<td>Required</td>
</tr>
<tr>
<td>1 User Name</td>
<td>Text Entry</td>
<td>✔</td>
</tr>
<tr>
<td>2 Script/Command</td>
<td>Text Area</td>
<td></td>
</tr>
<tr>
<td>3 Stage</td>
<td>Dropdown menu</td>
<td>✔</td>
</tr>
<tr>
<td>4 Priority</td>
<td>Radio Selector</td>
<td>✔</td>
</tr>
<tr>
<td>5 QA Verification Required</td>
<td>Checkbox</td>
<td></td>
</tr>
<tr>
<td>6 User Name and Password Credential</td>
<td>✔</td>
<td></td>
</tr>
</tbody>
</table>

---
Looking Up Parameters

To apply parameters to an application or component process step, starting in the Application Process Visual Editor:

1. Add a new step to the process.

   **Example:**

   ![Diagram of process flow with a new step added]

2. Define the process step in the **Define Step** dialog box.

   **Example:**

   ![Diagram of the Define Step dialog box]

Delete this text and replace it with your own content.
3. When you define the process step with a plugin (Plugins), command or script (Command), or project (Procedure), click the Lookup button to open the Parameter Lookup dialog box.

**Example:**

The Parameter Lookup dialog box opens.

4. Choose a parameter and click the Copy button to copy the path reference.

   A message appears in the row: `<Parameter Name>` has been copied.

   The Define Step dialog box now has a Parameter field.

5. Click in the Parameter field and paste the path reference that you copied in it.

6. Repeat the previous two steps to apply another parameter to the process step.

7. Click OK.

**Adding Credentials**

**How to get here:** From the Component Process Step or the Application Process Step dialog box, click >. The Credentials dialog box opens.

You can attach one or more credentials to component process steps and application process steps.

You attach only one credential for impersonation on the following:

- Component process
- Component process step
- Application process
- Application process step
IMPORTANT:
When you impersonate a credential, make sure that the impersonated user has the absolute path to the bin directories in the $PATH environment.
If you define a process step with a command, you must enter the absolute path in the Post Processor and Shell fields in the Define Step dialog box.

1. Click in the Add Credentials field.

Example:

2. To impersonate one credential, select Impersonate in the Type field.
3. Click the Select Credential field to open a drop-down list of credentials for the process step.
4. Select a credential.
5. Click OK.

The Credentials dialog box now shows the one credential for impersonation.
6. To attach one or more credential to the process step, select Attach in the Type field.
7. Click the Select Credential field to open a drop-down list of credentials for the process step.
8. Select a credential.
9. Click OK.

The Credentials dialog box now shows the attached credentials.

Using Plugins

When you want to use a plugin to define your application or component process step, all of the supported plugins appear in the Plugin Manager in the Currently Installed tab in the ElectricCommander automation platform. However, you may want to see only the list of plugins that apply to your group or organization, such as Apache Subversion (SVN) and Git plugins. You can remove any plugins that you are not using from the Currently Installed tab. You can re-install them later if you need them.

To remove plugins from the Currently Installed tab:
1. In the Home page, click the **Main menu** button and then click **Admin > Plugins**.

   The Plugin Manager opens.

   ![Plugin Manager](image)

2. In the **Currently Installed** tab, select a plugin in the list.

3. In the **Actions** column for the selected plugin, click **Demote**.

   The page refreshes.

   The plugin is now inactive but is still in the list. If you want to use this plugin, click **Promote** to make it active.

4. If you want to remove the plugin from this list, click **Uninstall** to remove it from your system.

   For more details, go to the **ElectricCommander Help > Web Interface Help > Plugin Manager**. This page describes what you can do in the Plugin Manager, including how to install a new version of a plugin or add a new plugin.

You can see all of the plugins available from Electric Cloud in the **View Catalog** tab on the **Administration > Plugins** page. To show a list of plugins that you can install directly from Electric Cloud, do the following:

1. Click **Install** in the **Action** column.
2. Go to the **Currently Installed** tab.
3. Choose a plugin and click **Promote**.

   The new plugin is now available for use in your system.

### Setting Email Notifications

**Review these guidelines before setting notifications:**

New email notifications are disabled in the application, its application processes, and the process steps before you configure them.
You configure notifications in the "Application notifications / edit" dialog box.

**IMPORTANT:** The first time that you set notifications in this dialog box, the Notifications toggle changes to On. After you enter notification settings and click OK, email notifications are enabled at that level.

Go to Application Notifications Dialog Box on page 73 for information about how to use the "Application notifications" and "Application notifications /edit" dialog boxes.

By default, the application expects that the user creates an email configuration called "default." The email configuration defaults to the server property /server/ec_deploy/ec_defaultEmailConfiguration, which is set to ‘default’.

If you want to use a different name for the email configuration, change the value of /server/ec_deploy/ec_defaultEmailConfiguration to the new email configuration name.

Starting from the Home page, to set email notifications:

1. Go to the Applications List.

   **Example:**
2. Select an application.

The Applications Visual Editor opens.

**Example:**

![Applications Visual Editor](image)

3. Click the **Menu** button.

**Example:**

![Menu button](image)

The Applications menu opens.

**Example:**

![Applications menu](image)
4. Click **Notifications** to add a new application.

**Example:**

![Notifications button]

The Application notification dialog box opens.

**Example:**

![Application notifications dialog box]
5. Configure email notifications for the application, an application process, or a process step.

You can configure one or more notifications in an application process or other object.

**Configuring recipients**

In the **Who** field, you add users or groups who are configured and managed in the ElectricCommander platform or email addresses.

When you start typing a user name, group name, or email addresses, a list of names or email addresses appear that match what you are typing.

**Example:**

![Application notifications / edit](image)

If one of the suggestions matches the name or email address, select it, or continue typing. You can add more than one name or email address.

**Example:**

![Application notifications / edit](image)
**Configuring the event that triggers the notification**

In the **When** field, you select the event that triggers a notification to be sent to the recipients in the **Who** field. The default is **Both Failed and Successful**. Click in the **When** field to select the event for the notification.

**Example:**

![Application notifications / edit](image)

**Configuring the environments where the notification applies**

In the **Where** field, you select the environments to which the notifications apply. Click in the **Where** field to select the environments, which are the environments to which the application is mapped in the tier map.

**Example:**

![Application notifications / edit](image)

6. Select and edit the email notification message.
7. Add another notification for the application, an application process, or a process step.

Click the **Add Notifications** button to add a new notification.

**Example:**

![Add Notifications button](image)

After you have added your email notifications, click **OK** to save the settings and return to the Application notifications dialog box.

**Example:**

![Application notifications dialog box](image)
8. (Optional) Enable email notifications for the application, application processes, or process steps that are not already enabled.

To enable email notifications at the application level:

- Click the Notifications toggle and change it to On.

The status of the application changes to On.

**Example:**

To enable notifications at the application process and process step levels, go to the Application Notifications / edit dialog box for the specific process or process step.

The dialog box opens, and the Notifications toggle is now On.

**Example:**
When you enter notification settings in the dialog box and click **OK**, the settings are saved. The **Application notifications** dialog box appears and now shows that the application process status is **On**.

**Example:**

Starting in the "Application notifications / edit" dialog box:

1. Click the **Template** button.
   
   A drop-down box opens.

   **Example:**
2. Click the down arrow to open the list of email message templates that can apply to the application.
3. Select a template.

**Example:**

![Application notifications / edit](image)

If the template is the current template applied to notification, the name of the template appears in dialog box.

**Example:**

![Apply email message template](image)

If the template is not the current template, the **Apply** and **Edit** buttons appear in the dialog box.

**Example:**
4. If you want to use the template that you selected instead of the current one and do not want to change it, skip the remaining steps in this task.

5. If you want to apply a different template or edit the template that you selected, do the remaining steps in this task.

   If you click **Apply** to use the template as is, skip the remaining steps.

   If you click **Edit** to modify the template to fit your needs, go to the next step.

   The Email Message Preview dialog box appears.

**Example:**
6. To edit the template:

   Change the name of the template in the **Name** field.
   
   Change the subject of the email in the **Email subject line**.
   
   To modify the body of the email message, click **Edit HTML** and edit the HTML code.

   **Example:**

   ![Email Message Preview](image)

7. Click **Preview**.

8. To save your changes:

   - Click **Save Changes** to save the change in an existing template
   - Click **Save as New** to save the template as a new template.

   The "Application notifications / edit" dialog box re-appears.
9. Click the down arrow to open the list of email message templates that can apply to the application.

   The new email message template is in the list.

   **Example:**

   ![Image of email message template selection]

10. Click **OK** to save the settings.

### Modeling Dynamic Environments

A dynamic environment is an environment that is provisioned using an environment template. You can add provisioned cloud resources as well as static resources to an environment template. All of the following are considered to be dynamic environments:

- An environment with only provisioned cloud resources
- An environment with only static resources added to an environment template
- An environment with provisioned cloud resources and static resources.

This is the high-level process to provision cloud resources that can be dynamically spun up during the application deployment.

1. Create and define one or more resource templates.

   The resource template has the information required to spin up the resources on an on-demand basis and to provision dynamic resource pools. It has the following information:

   - Cloud provider and cloud instance details
   - Configuration management settings
• Both cloud provider and configuration management settings

2. Create and define one or more environment templates.

When modeling an environment template, you define the environment tiers and then add resources to the tiers. You can either add static resources or a resource template to an environment tier.

When adding static resources, you can select one or more resources to add to the tier.

When adding resource templates, you can select only one to add to the tier and then enter the number of resources to provision to add dynamic resources to the tier.

Environment templates have this information:

• Name and description
• Environment tier details and properties
• Resources assigned to the environment tiers
• Cloud resource details from the resource templates

**Usage Guidelines and Best Practices**

This matrix shows the resource types that are allowed in environments and environment templates.

<p>| Resource Type      | Origin | Environment Tier | Environment Template Tier | Use Rules | |
|--------------------|--------|------------------|---------------------------|-----------|
| Static resources   | –      | Yes              | Yes                       | You may only add them to one environment. You cannot re-use them in more than one environment. You can add one or more static resources to an environment tier or an environment tier template. |
| Static resource pool | –     | Yes              | No                        | You may only add it to one environment. You cannot re-use it in more than one environment. You can add only one resource pool to an environment tier. |</p>
<table>
<thead>
<tr>
<th>Resource Type</th>
<th>Origin</th>
<th>Environment Tier</th>
<th>Environment Template Tier</th>
<th>Use Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource pool provisioned in the resource template</td>
<td>ElectricCommander automation platform</td>
<td>Yes</td>
<td>No</td>
<td>You may only add it to one environment. You cannot re-use it in more than one environment. You can add only one resource pool to an environment tier.</td>
</tr>
<tr>
<td>Resource pool provisioned in an environment template</td>
<td>ElectricFlow</td>
<td>No</td>
<td>No</td>
<td>You cannot re-use the resource pools provisioned in an environment template. You can only use it in the dynamic environment created by the environment template.</td>
</tr>
<tr>
<td>Resource template</td>
<td>–</td>
<td>No</td>
<td>Yes</td>
<td>You may only add one resource template to an environment template tier.</td>
</tr>
</tbody>
</table>

In environments and environment templates, you can create a tier with static resources, a static resource pool, or a static resource template. When you are editing the tier, ElectricFlow maintains the initial resource-type association.

For example, if you initially add static resources to an environment tier, you can add only static resources to it. You are not allowed to add a resource this environment tier.

**Creating AMIs**

Before creating a resource template, you must create an Amazon Machine Image (AMI) with a pre-installed agent for the cloud provider. In ElectricFlow 5.4, Amazon EC2 and OpenStack are the supported cloud providers.

**AMIs with Commander Agents**

1. Install agents on Commander server node machines.

   See the following sections in the *ElectricCommander Installation Guide* for detailed instructions:

   - System Requirements and Supported Platforms > Agent Platforms
   - System Requirements and Supported Platforms > Server and Agent Compatibility
   - Installing ElectricCommander > Interactive Command-line Installation Method > Express Agent Command-Line
2. Create the AMI on the Amazon EC2 or OpenStack platform.
   Go to http://docs.openstack.org/image-guide/content/index.html for OpenStack.
3. Create a resource template in ElectricFlow.
   When you set the cloud provider, you can select Amazon or OpenStack and enter information in the fields in the dialog boxes. The fields that you see depend on the cloud provider that you select.
   For detailed Amazon EC2 instructions, go to Configuring Amazon EC2 as the Cloud Provider.
   For detailed OpenStack instructions, go to Configuring OpenStack as the Cloud Provider.

### AMIs with Commander Agents and Chef Configuration Management

1. Install agents on Commander server node machines.
   See the following sections in the ElectricCommander Installation Guide for detailed instructions:
   - System Requirements and Supported Platforms > Agent Platforms
   - System Requirements and Supported Platforms > Server and Agent Compatibility
   - Installing ElectricCommander > Interactive Command-line Installation Method > Express Agent Command-Line
   - Installing ElectricCommander > Non-Server Platform Agent Installation Method
   - Configuration > Environment Proxy Server Configuration > Configuring Proxy Agents

2. Configure a Chef server with run-lists that will be applied to your cloud resources.
   Go to http://docs.chef.io/.
3. Create the AMI on the Amazon EC2 or OpenStack platform.
   Go to http://docs.openstack.org/image-guide/content/index.html for OpenStack.
4. Create a resource template in ElectricFlow.
   a. When you set the cloud provider, you can select Amazon or OpenStack and enter information in the fields in the dialog boxes. The fields that you see depend on the cloud provider that you select.
      For detailed Amazon EC2 instructions, go to Configuring Amazon EC2 as the Cloud Provider.
      For detailed OpenStack instructions, go to Configuring OpenStack as the Cloud Provider.
   b. When you set the configuration management tool, select Chef.
      For detailed instructions, go to Configuring Chef as the Configuration Management Tool.
Creating Resource Templates

1. Go to the Resource Templates List.
   - Starting from the Main menu, click the **Menu** button, select **Environments**, and then select **Resource Templates**.
   - Starting from the Home page, click **Environments** and then click the **Resource Templates** tab.

   If there are no defined resource templates, the Resource Templates List is empty.

   **Example:**

   ![Resource Templates List](image)

2. Add a resource template.
   a. If the Resource Templates List is empty, click **There are no Resource Templates yet. Add one +** or click the **Add +** button.
   b. If the Resource Templates List is not empty, click the **Add +** button.
   c. When you click **There are no Resource Templates yet. Add one +**, the **New Resource Template** dialog box opens.

   **Example:**

   ![New Resource Template](image)

3. To create a new resource template:
   - Click **Create New**.
     - Enter the name of the template and an optional description of the template.
     - Click **Next**. The **New Cloud Provider** dialog box opens.
     - Go to Step 4 to Step 7 to complete the process to create a new template.

4. Enter the cloud provider settings.
5. To set Amazon EC2 as the cloud provider, go to Configuring Amazon as the Cloud Provider for detailed instructions.

**IMPORTANT:** Before configuring the cloud provider, you must have an Amazon Machine Image (AMI) with a pre-installed agent available.

6. To set OpenStack as the cloud provider, go to [Configuring OpenStack as the Cloud Provider](#) for detailed instructions.

7. (Optional) Enter the change management settings.

8. To set Chef as the configuration management tool, go to Configuring Chef as the Configuration Management Tool on page 284 for detailed instructions.

After completing all these steps, the Resource Template List now shows the templates that you created.

**Configuring Amazon EC2 as the Cloud Provider**

**IMPORTANT:** Before configuring the cloud provider, you must have an Amazon Machine Image (AMI) with a pre-installed agent available.

Starting in the New Cloud Provider dialog box:

**Example:**

![New Cloud Provider dialog box example](image-url)
1. Click **Select cloud provider**.

2. Select **Amazon**.

   The **Account Setup** fields appear.

   **Example:**

   ![Account Setup Example](image1)

   ![Account Setup Example](image2)

   **IMPORTANT:** If you have a pre-configured account with the Account Setup and Provision Parameter settings, click **Select account** to automatically enter the cloud provider settings. Then go to Step 6.
3. Enter your account settings:

- **Configuration Name**—A unique name for the EC2 connection (Required)
- **Description**—A description for this configuration. The default is *EC2 integration*.
- **Service URL**—The service URL for the EC2 service. For the Amazon public EC2, this should be https://ec2.amazonaws.com. (Required)
- **Resource Pool**—The name of the pool of resources on which the integration steps can run. The default is *default*.
- **Workspace**—The workspace to use for resources dynamically created by this configuration. The default is *default*.
- **Access ID’s**—The access IDs, *Access ID* and *Secret Access ID*, that are required for communicating with Amazon EC2.

  The configuration stores these as a credential, putting the Access ID in the **User Name** field of the credential and the Secret Access ID in the **Password** and **Retype Password** fields of the credential.

- **Attempt Connection**—If the check box is selected, the system tries a connection to check credentials.
- **Debug Level**—The debug level for the output. The default is 1.

  The possible values are
  
  - 0 – Errors only.
  - 1 – Normal headers and responses.
  - 2+ – Debugging information included.

**Example:**

![Example Diagram]
5. Enter the **Provision Parameters** values.

   - **Configuration**–This field is prepopulated with the name you entered in the previous dialog box.
   - **Number of Instances**–The number of instances to start. The default is 1.
   - **Group**–The security group to use. The default is *default*.
   - **Image**–The name of the EC2 image deploy.
   - **Instance Type**–The instance type. The default is **Small(m1.small)**.

   Select one of these types:
   - Small(m1.small)
   - Large(m1.large)
   - Extra Large(m1.xlarge)
   - Micro(t1.micro)
   - High-Memory Extra Large(m2.xlarge)
   - High-Memory Double Extra Large(m2.2xlarge)
   - High-Memory Quadruple Extra Large(m2.4xlarge)
   - High-CPU Medium(c1.medium)
   - High-CPU Extra Large(c1.xlarge)
   - Cluster Compute Quadruple Extra Large(cc1.4xlarge)
   - Cluster GPU Quadruple Extra Large cg1.4xlarge

   - **Key name**–The name of the key pair to use.
   - **Results Location**–Where to put the result. If the location is not specified, the result is only printed.
   - **User Data**–Extra user data to pass to the API_runInstances procedure.
   - **Zone**–The zone where the instance is created.
   - **Resource Pool**–Name of the resource pool. If you enter a name, a new resource is created and put in the pool.
   - **Commander Workspace**–Name of the workspace where the resources are created.
   - **Resource Port**–ID of the port to which the new resources are assigned.
   - **Subnet Id**–The ID of the subnet in which the instances are launched. This parameter is used with VPCs.
   - **Use Private IP for subnet**?–If this check box is selected, the subnet is Private IP network.

6. Click **Next** to set the configuration management settings.

   The **New Configuration Management** dialog box opens.

   Return to **Creating Resource Templates** on page 271 for instructions to continue creating the resource template.
7. If you do not want to set the configuration management settings, click OK.

The Resources Templates list now shows the resource template that you created.

Return to Creating Resource Templates on page 271 for instructions to continue creating the resource template.

Configuring OpenStack as a Cloud Provider

**IMPORTANT:** Before configuring the cloud provider, you must have an Amazon Machine Image (AMI) with a pre-installed agent available.

Starting in the New Cloud Provider dialog box:

**Example:**
1. Click **Select cloud provider**.
2. Select OpenStack.

The Account Setup fields appear.

**Example:**
IMPORTANT: If you have a pre-configured account with the Account Setup and Provision Parameter settings, click **Select account** to automatically enter the cloud provider settings. Then go to Step 6.
3. Enter your account settings:

- **Configuration Name**—A unique name for the OpenStack configuration. (Required)
- **Description**—A description for this configuration. The default is *OpenStack configuration*.
- **Identity Service URL**—The host name or IP address of the Identity Service for OpenStack. (Required)
- **Compute Service URL**—The host name or IP address of the Compute Service for OpenStack. (Required)
- **Blockstorage URL**—The host name or IP address of the Block Storage Service for OpenStack. (Required)
- **Image Service URL**—The host name or IP address of the Image Service for OpenStack. (Required)
- **Orchestration Service URL**—The host name or IP address of the Orchestration Service for OpenStack. (Required)
- **Login as**—OpenStack account username and password. It must have enough privileges to perform API functions. (Required)
- **Compute API version**—The version of the Compute Service API. The default is 2.0. (Required)
- **Keystone API version**—The version of the Keystone Service API. The default is 3. (Required)
- **Blockstorage API version**—The version of the OpenStack block storage API. The default is 1. (Required)
- **Image API version**—The version of the Image Service API. (Required)
- **Resource**—The name of the resource or pool on which the integration steps can run. The default is *local*. (Required)
- **Workspace**—The workspace where the configuration dynamically creates resources. The default is *default*. (Required)
- **Debug Level**—The debug level for the output. The default is 1.

The possible values are

- **0** – Errors only.
- **1** – Normal headers and responses.
- **2+** – Debugging information included.

**Example:**

![Cloud Provider Provision Parameters example]

![Cloud Provider Provision Parameters example]
5. Enter the **Provision Parameters** values.

   - **Configuration**—The name of a valid existing configuration with the connection information. (Required)
   - **Tenant ID**—The ID of the tenant to use. (Required)
   - **Number of Instances**—The number of servers to deploy. If there is more than one, a suffix (\_#) os added to the server names. The default is 1. (Required)
   - **Image ID**—The ID of an existing image in OpenStack. (Required)
   - **Flavor ID**—The ID of the flavor to use. (Required)
   - **Key Pair Name**—The name of a key pair to use. (Required)
   - **Security Group(s)**—A list of security groups.
   - **Availability Zone**—The zone where the server is launched.
   - **Customization script**—Configuration information or scripts to execute when the server starts.
   - **Results Location**—Where the properties are stored.
   - **Resource Pool**—The resource pool name associated with the machines in this configuration when resources are created. .
   - **Resource workspace**—The workspace that the resource uses.

6. Click **Next** to set the configuration management settings.

   The New Configuration Management dialog box opens.

   Return to Creating Resource Templates on page 271 for instructions to continue creating the resource template.

7. If you do not want to set the configuration management settings, click **OK**.

   The Resources Templates list now shows the resource template that you created.
8. Return to Creating Resource Templates on page 271 for instructions to continue creating the resource template.

**Configuring Chef as the Configuration Management Tool**

Starting in the New Configuration Management dialog box:

**Example:**
1. Click **Select cloud provider**.
2. Select **Amazon**.

The **Account Setup** fields appear.

**Example:**

![Configuration Management](image1)

![Configuration Management](image2)

**IMPORTANT:** If you have a pre-configured account with the Account Setup and Converge Parameter settings, click **Select account** to automatically enter the configuration management settings. Then go to Step 6.
3. Enter your account settings:
   - **Configuration Name**–A unique name for the configuration. (Required)
   - **Description**–A description for this configuration. The default is *Chef configuration*.
   - **Chef Server URL**–URL to the Chef server.
   - **Login as**–Private key for authentication. (Required)

   To log in, enter the **User Name** and **private Key**.
4. Click **Next**.

The **Converge Parameters** fields appear.

**Example:**
5. Enter the **Provision Parameters** values.
   - **Configuration**—This field is prepopulated with the name you entered in the previous dialog box.
   - **Chef-client Path**—The path to the chef-client (executable), such as /usr/bin/chef-client (the default value). (Required)
   - **Run as user with full system privileges**—If this check box is selected, you run the application as a user with full system privileges.
   - **Run List**—The ordered list of Chef recipes to run.
   - **Node Name**—The name of the node to which recipes are added. (Required)
   - **Additional Arguments**—Additional arguments use when running the application.

6. Click **OK**.

   The Resource Templates List now shows the resource template that you created.


**Viewing and Editing Resource Templates**

*Resource Template Details*

To view and edit the resource template details, starting in the Resource Template List:

1. Choose a resource template and click the **Menu** button.

   A list of menu options appears.

   **Example:**

   ![Resource Templates List](image)
2. Select **Details**.

   The **Edit Resource Template Details** dialog box opens.

   **Example:**

   ![Diagram of Edit Resource Template Details dialog box]

3. In the **Details** tab, edit the name and description of the resource template.

4. In the **Cloud Provider** tab, edit the cloud provider account information.

   **Example:**

   ![Diagram of Cloud Provider tab]
5. In the **Provision** tab, edit the information about a provision settings for the cloud provider.
   
   **Example:**

   ![Provision Tab Example](image1)

6. In the **Configuration** tab, view and edit the configuration management details.

   **Example:**

   ![Configuration Tab Example](image2)
7. In the **Converge** tab, view and edit the details about how the virtual instances are converged in the defined configuration.

   **Example:**

   ![Converge tab example](image)

8. Click **Next** to go to the next tab.
9. Click **OK** to save your changes.

**Resource Template Properties**

To view and edit the resource template properties, starting in the Resource Template List:

1. Choose a resource template and click the **Menu** button. A list of menu options appears.

2. Select **Properties**.

   The **Properties** dialog box opens.

   **Example:**

   ![Properties dialog box example](image)

3. To view more details about a property, click the **Expand** button next to the property name.
4. To add a property:
   a. Click the Add + button.

   The **Property Details** dialog box opens.

   Example:

   ![Property Details Dialog Box](image)

   b. Enter the details and click OK to save them.

   The **Property Details** dialog box now shows the new property that you added.

   Example:

   ![Property List](image)

**Access Control Settings**

When you click **Access Control**, you go to the Access Control page in the ElectricCommander automation platform.

**Change Tracking**

When you click **Track Changes**, the Change History for the resource template opens.

**Resources Page**

**How to get here:** Click the Main Menu button > Automations > Resources.

In the Resources page, click the name of the resource template to view the resource template details.
The **Edit Resource Template Details** dialog box opens:

![Edit Resource Template Details dialog box]

You can view and edit the resource template details as described in the previous sections.

### Resource Pools Page

**How to get here**: Go to the ElectricCommander Help > **Cloud** tab > select **Pools**.

In the **Resource Pools** page, you get information about the resource pools. The page lists static and dynamic resource pools. Static resource pools are created in the ElectricCommander automation platform. Dynamic resource pools are created by provisioning a resource template in ElectricFlow or in the ElectricCommander automation platform.

![Resource Pools page]

When you click the name of the resource template that provisioned the dynamic resource pool, the **Edit Resource Template Details** dialog box opens, where you can view the details.
You can view and edit the resource template details as described in the previous sections.

**Accessing the Resource Templates in the ElectricCommander Automation Platform**

You can access the resource templates from the ElectricCommander automation platform.

1. In the Home page, click **Automations** to go to the Home page of the ElectricCommander automation platform.

2. Go to **Cloud > Pools**.

   **Example:**

   ![Image of resource templates in ElectricCommander](image)

3. Click **Resource Templates**.

   The **Resource Templates** list opens.

   **Example:**

   ![Image of resource template list in ElectricCommander](image)
4. (Optional) To view details about a resource template, choose a template and click the Menu button for it.

The Context menu opens.

5. Click one of these options:
   - **Details**—The Edit Resource Template Details dialog box opens.
     The tabs that appear in the dialog box depend on the cloud provider specified in the resource template.
   - **Properties**—The Properties dialog box opens.
     You can view and edit the properties that apply to the resource template.
   - **Access Control**—The Access Control page opens.
   - **Track Changes**—The Change History for the resource template opens.

6. To provision the resource template, choose a resource template and click the Provision button.

The Provision Cloud Resources dialog box opens.

**Example:**

![Provision Cloud Resources dialog box](image)
7. Enter the resource pool name, an optional description, and the number of resources in the pool, and then click **OK**.

**Example:**

![Resource Pool Creation Example](image1)

You go to the Job Details page in the ElectricCommander automation platform.

**Creating Environment Templates**

**Creating a New Environment Template**

1. Go to the Environment Templates List.
   - Starting from the Main menu, click the **Menu** button, select **Environments**, and then select **Environment Templates**.
   - Starting from the Home page, click **Environments** and then click the **Environment Templates** tab.

If there are no defined resource templates, the Resource Templates List is empty.

**Example:**

![Environment Templates List Example](image2)
2. Add a resource template.
   a. If the Resource Templates List is empty, click *There are no Environment Templates yet. Add one* or click the Add + button.
   b. If the resource list is not empty, click the Add + button.
   c. When you click *There are no Environment Templates yet. Add one*, the New Environment Template dialog box opens.

   **Example:**

   ![Environment Template dialog box](image1)

   d. After you click the Add + button, click Environment Template in the New dialog box. The New Environment Template dialog box opens.

   **Example:**

   ![New Environment Template dialog box](image2)
3. Click **Create new environment template** to create a template with new settings.

   The **New** dialog box opens.

   **Example:**

   ![Image](image1.png)

4. Enter a name and an optional description, and click **OK**.

   The **Environment Templates Visual Editor** opens. The name of the environment template is at the top of the page. There is one tier with no assigned resources.

   **Example:**

   ![Image](image2.png)

5. Click the **+** button to add a resource to the tier.

   The **New** dialog box to add resources opens.

   **Example:**

   ![Image](image3.png)

6. Click **Add resource template** to select a resource template.

   The Resource Templates List opens.
7. Select a resource template and click OK.

**Example:**

The **New** dialog box to select the number of resources to provision opens.

**Example:**
8. Enter the number of resources to provision and click OK.
   You must provision at least one resource (1).

   Example:

   ![Image of entering resource number]

   The Environment Templates Visual Editor now shows that the tier (Tier 1) has 10 provisioned dynamic cloud resources.

   Example:
9. To add static resources to an environment template:
   
a. Click the Add tier button to create a new tier.
   
   
b. Click the + button in the new tier to add resources to it.
   
   The New dialog box opens.
   
c. Click Add resources to add static resources to the environment tier.
   
   A list of static resources opens.
   
   **Example:**

   ![Image of static resources in the New dialog box]

   d. Select one or more resources in the list, and click **OK**.
   
   The Environment Templates Visual Editor now shows that Tier 2 has two static resources.
   
   **Example:**

   ![Image of the Environment Templates Visual Editor showing two static resources]

   **Creating an Environment Template Based on an Existing Template**

   1. Go to the Environment Templates List.
      
      - Starting from the Main menu, click the **Menu** button, select **Environments**, and then select **Environment Templates**.
      
      - Starting from the Home page, click **Environments** and then click the **Environment Templates** tab.
2. Add a resource template.

If the Resource Templates List is empty, click **There are no Environment Templates yet. Add one +** or click the **Add +** button.

If the resource list is not empty, click the **Add +** button.

When you click **There are no Environment Templates yet. Add one +**, the **New Environment Template** dialog box opens.

**Example:**

![New Environment Template dialog box]

After you click the **Add +** button, click **Environment Template** in the **New** dialog box. The **New Environment Template** dialog box opens.

**Example:**

![New Environment Template dialog box]
3. Click **Create from existing** to create a template based on an existing one.

   The list of existing templates opens.

   **Example:**

   ![Image](image1.png)

4. Select an environment template.

   The **New** dialog box opens.

   **Example:**

   ![Image](image2.png)

---

**Viewing and Editing Environment Templates**

*Environment Template Details*

To view and edit the environment template details, starting in the Environment Template List:

1. Choose an environment template and click the **View Details** button.

   **Example:**

   ![Image](image3.png)

   The Environment Templates for the selected template opens.
2. Click to **Menu** button to open the context menu for the environment template.

**Example:**

Click **Details** to view or edit the name and description of the environment template.

Click **Properties** to view or edit the environment template properties.

Click **Access Control** to go to the Access Control page in the ElectricCommander automation platform.

Click **Track Changes** to open the Change History of the environment template.

Click **Delete** to delete this template.
3. In an environment tier with dynamic resources, click the **Menu** button for the resources.

The context menu opens.

**Example:**

![Menu button example](image)

4. Click **Details**. The list of resource templates opens.

The template being used is selected.

**Example:**

![Resource template list](image)

5. Click the **Edit** button in an environment tier with dynamic resources.

The number box opens and shows the number of provisioned dynamic resources. In the example, there are 10 dynamic resources.
6. To change the number of provisioned dynamic resources:
   a. Click the **Edit** button in an environment tier with dynamic resources.
      
      **Example:**
      
      ![Diagram showing a tier with a number box and a button for editing](image1)

   b. Enter a new number.
      
      Use the up and down arrows to change the number.
      
      You must enter one or more dynamic resources.
      
      **Example:**
      
      ![Diagram showing a tier with a number box and a new number](image2)

      As you change the number of resources in the number box, the visual editor automatically updates the environment tier.

   c. Click outside of the tier or press **Enter** to save the change.
      
      The Environment Templates Visual Editor now shows the new number of dynamic resources for the tier.
      
      **Example:**
      
      ![Diagram showing the updated environment with the new number of resources](image3)
7. To change the resource template being used:
   a. Click the **Menu** button for the resources in an environment tier with dynamic resources.
   b. Click **Details** in the context menu. The list of resource templates opens.
   c. Select a different template other than the one that is currently selected.
      
      A message appears.
      
      **Example:**

      ![Example Image]

      d. Click **Yes** to replace the current template with the one that you selected.
      
      The **Edit** dialog box to select the number of resources to provision opens.
      
      **Example:**

      ![Example Image]
e. To edit the number of dynamic resources to provision, enter the number and click **OK**.

The Environment Templates Visual Editor now shows that tier has the new number of dynamic resources.

**Example:**

![Environment Templates Visual Editor](image)

**Modeling Environments with Resources or Resource Pools**

1. Go to the Environment List.
   - Starting from the Main menu, click the **Menu** button, select **Environments**, and then select **Environments**.
   - Starting from the Home page, click **Environments**.
2. Click the **Add** button to add an environment.

**Example:**

![Environment List]

The **New** dialog box opens.

**Example:**

![New Environment Dialog]

3. Click **Environment**.

The **New Environment** dialog box opens.

**Example:**

![Create New Environment]

4. Select **Create new environment**.

5. Enter the name of the environment and an optional description, and then click **OK**.
6. Click the + button to add resources to the environment tier.

**Example:**

![Diagram showing the + button to add resources to the environment tier]

The **New** dialog box to add resources or a resource pool to the environment tier.

**Example:**

![Diagram showing the New dialog box to add resources or a resource pool to the environment tier]
7. To add one or more static resources:
   a. Click **Add resources**.
      
      A list of resources appears.
   
   b. Select one or more resources, and then click **OK**.

**Example:**

![Example Image](image)

The Environments Visual Editor now shows a tier with two static resources.

**Example:**

![Example Image](image)
8. To add a resource pool:
   a. Click **Add resource pool**.
      A list of resource pools appears.
   b. Select one resource pool, and then click **OK**.

   **Example:**

   ![Resource Pool List](image)
   The Environments Visual Editor now shows a tier with the resource pool that has two resources.

   **Example:**

   ![Environments Visual Editor](image)

**Developer Task: Creating Custom Plugins**

ElectricFlow uses third-party plugins to provision cloud resources in resource templates for Dynamic Environments. Starting in ElectricFlow 5.4, Amazon EC2 (EC-EC2) and Openstack (EC-OpenStack) are supported as out-of-the-box cloud provider plugins, and Chef (EC-Chef) is supported as an out-of-the-box configuration management plugin.

To view the supported cloud provider plugins, open the **New Cloud Provider** dialog box and click **Select cloud provider** to view the drop-down menu of cloud providers.

![New Cloud Provider Dialog](image)

To view the supported configuration management plugins, click **Select configuration management** to view the drop-down menu of configuration management tools.
If you have an existing procedure that you would prefer to use instead of an out-of-the-box third-party plugin to provision cloud resources, you can create a custom plugin based on your deployment scenario.

The process to create custom cloud provider and configuration management plugins uses metadata to loosely couple them to the application you want to deploy. The custom plugins define specific known properties that are automatically recognized by Dynamic Environments.

- Go to Creating Custom Cloud Provider Plugins on page 313 for the details to create cloud provider plugins.
- Go to Creating Custom Configuration Management Plugins on page 317 for the details to create configuration management plugins.

An ElectricFlow user can now deploy an application by selecting the environment template that provisions cloud resource using one or more custom plugins.

Go to Deploying Applications With Provisioned Cloud Resources on page 321 for the details.

Creating Custom Cloud Provider Plugins

This section applies to developers who want to create custom cloud provider plugins for Dynamic Environments in ElectricFlow.

How to Create a Custom Cloud Provider Plugin

1. To convert your procedure to a plugin, define the name of the plugin and the ElectricFlow project to which the plugin belongs.

   Later in this procedure, you will use these properties to create pre- and post-hooks to the plugin in ElectricFlow.
2. Define the following properties in your plugin under a top-level plugin property called `ec_cloudprovisioning_plugin`, which the Dynamic Environment system can access.

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ec_cloudprovisioning_plugin/</td>
<td>Top-level plugin property directory</td>
</tr>
<tr>
<td>Properties defined by the custom plugin under <code>ec_cloudprovisioning_plugin</code></td>
<td></td>
</tr>
<tr>
<td>displayName</td>
<td>Name of the plugin that appears in the New Cloud Provider dialog box.</td>
</tr>
<tr>
<td></td>
<td>Example: Amazon for the EC-EC2 plugin</td>
</tr>
<tr>
<td>hasConfiguration</td>
<td>`&lt;Boolean flag - 0</td>
</tr>
<tr>
<td></td>
<td>• When this property is set to 0, the plugin does not have any configuration procedures (CreateConfiguration and DeleteConfiguration).</td>
</tr>
<tr>
<td></td>
<td>• When this property is set to 1, the plugin has configuration procedures.</td>
</tr>
<tr>
<td>configurationLocation</td>
<td>Name of the property sheet used by the plugin to store the saved configurations.</td>
</tr>
<tr>
<td></td>
<td>This value is relative to the plugin's top-level properties.</td>
</tr>
<tr>
<td></td>
<td>If this value is set as ec2_cfgs, the configurations are in <code>/plugins/&lt;PLUGIN_KEY&gt;/project/ec2_cfgs</code>.</td>
</tr>
<tr>
<td>operations/</td>
<td>Property sheet for the specific operations required by the Dynamic Environment system.</td>
</tr>
<tr>
<td>Properties under operations/ –</td>
<td>These operations are mapped to the plugin operations through the following child properties.</td>
</tr>
<tr>
<td>createConfiguration/</td>
<td>Properties for the procedure that creates the plugin configuration. It is usually called createConfiguration.</td>
</tr>
<tr>
<td>deleteConfiguration/</td>
<td>Properties for the procedure that deletes the plugin configuration. It is usually called deleteeConfiguration.</td>
</tr>
<tr>
<td>provision/</td>
<td>Properties for the procedure that provisions virtual instances.</td>
</tr>
<tr>
<td>retireResource/</td>
<td>Properties for the procedure that tears down a previously provisioned virtual instance backing the specified resource.</td>
</tr>
<tr>
<td>Property Name</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>retireResourcePool/</td>
<td>Properties for the procedure that tears down all previously provisioned virtual instances for the specified resource pool.</td>
</tr>
<tr>
<td>Properties for the previously listed operations defined in the operations property sheet</td>
<td></td>
</tr>
<tr>
<td>procedureName</td>
<td>Name of the procedure name in the plugin to which the operation is mapped.</td>
</tr>
<tr>
<td>ui_formRefs/</td>
<td>Property sheet that references the ui_forms properties defined under the plugin's top-level properties.</td>
</tr>
<tr>
<td>parameterRefs/</td>
<td>Property sheet for the input parameters to the procedure that can be used by the Dynamic Environment system. The parameter list is operation-specific.</td>
</tr>
</tbody>
</table>

Go to Creating Custom Cloud Provider Plugins on page 313 for an example of the properties for the EC-EC2 (Amazon) plugin.

3. Save the plugin file in the appropriate location on your Commander server.

4. To import the plugin file to the ElectricCommander automation platform:
   a. In the ElectricCommander platform, go to Administration > Plugins to open the Plugin Manager page.
   b. Click the Install from File/URL tab.
   c. In the File Install field, click Choose file to select the plugin file.
   d. Click Upload to install it.
      The plugin file appears in the Currently Installed tab.
   e. Find your plugin and click Promote in the Actions column to make it available for use by ElectricFlow.

5. In ElectricFlow, to create a resource template:
   a. Go to Creating Resource Templates on page 271 for the details.
   b. In the Select cloud provider field, select your plugin as the cloud provider.
   c. Enter the plugin settings in the form.
   d. (Optional) Set the configuration management tool.
      Go to Creating Resource Templates on page 271 for the details.
6. In the ectool API, enter the following commands to set pre- and post-hooks linking the plugin to an application that you later deploy in a dynamic environment.

   a. To create a pre-hook, enter

      ```
      ectool createHook postConfigurationHook --hookType POST_CONFIGURATION --procedureName <hookProcedure> --procedureProjectName <hookProject> --resourceTemplateName <awsResourceTemplate> --projectName default
      ```

      where `hookProcedure` is the your plugin name, `hookProject` is the name of the project to which the plugin belongs, and `awsResourceTemplate` is the name of the resource template that you created.

   b. To create a post-hook, enter

      ```
      ectool createHook preConfigurationHook --hookType PRE_CONFIGURATION --procedureName <hookProcedure> --procedureProjectName <hookProject> --resourceTemplateName <awsResourceTemplate> --projectName default
      ```

      where `hookProcedure` is the your plugin name, `hookProject` is the name of the project to which the plugin belongs, and `awsResourceTemplate` is the name of the resource template that you created.

7. Create an environment template with the resource template that you created.

**Example: Property Structure for a Cloud Provider Plugin**

This is the EC-EC2 (Amazon) plugin property structure.

<table>
<thead>
<tr>
<th>Property Name</th>
<th>Property Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>ec_cloudprovisioning_plugin/</td>
<td></td>
</tr>
<tr>
<td>displayName</td>
<td>Amazon</td>
</tr>
<tr>
<td>hasConfiguration</td>
<td>1</td>
</tr>
<tr>
<td>configurationLocation</td>
<td>ec2_cfgs</td>
</tr>
<tr>
<td>operations/</td>
<td>createConfiguration/</td>
</tr>
<tr>
<td></td>
<td>deleteConfiguration/</td>
</tr>
<tr>
<td></td>
<td>provision/</td>
</tr>
<tr>
<td></td>
<td>retireResource/</td>
</tr>
<tr>
<td></td>
<td>retireResourcePool/</td>
</tr>
<tr>
<td>ec_cloudprovisioning_plugin/createConfiguration/</td>
<td></td>
</tr>
<tr>
<td>procedureName</td>
<td>CreateConfiguration</td>
</tr>
<tr>
<td>ui_formRefs/</td>
<td>parameterForm called ui_forms/EC2CreateConfigForm</td>
</tr>
<tr>
<td>parameterRefs/</td>
<td>configuration called config</td>
</tr>
</tbody>
</table>
### Creating Custom Configuration Management Plugins

This section applies to developers who want to create custom configuration management plugins for Dynamic Environments in ElectricFlow.

### How to Create a Custom Configuration Management Plugin

1. To convert your procedure to a plugin, define the name of the plugin and the ElectricFlow project to which the plugin belongs.

   Later in this procedure, you will use these properties to create pre- and post-hooks to the plugin in ElectricFlow.
2. Define the following properties in your plugin under a top-level plugin property called `ec_configurationmanagement_plugin`, which the Dynamic Environment system can access.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>ec_configurationmanagement_plugin/</code></td>
<td>Top-level plugin property directory</td>
</tr>
</tbody>
</table>

### Properties defined by the custom plugin under `ec_configurationmanagement_plugin`:

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>displayName</code></td>
<td>Name of the plugin that appears in the Dynamic Environment UI</td>
</tr>
<tr>
<td><code>hasConfiguration</code></td>
<td>&lt;Boolean flag - 0</td>
</tr>
<tr>
<td></td>
<td>- When this property is set to 0 or false, the plugin does not have any configuration procedures (CreateConfiguration and DeleteConfiguration).</td>
</tr>
<tr>
<td></td>
<td>- When this property is set to 1 or true, the plugin has configuration procedures.</td>
</tr>
<tr>
<td><code>configurationLocation</code></td>
<td>Name of the property sheet used by the plugin to store the saved configurations.</td>
</tr>
<tr>
<td></td>
<td>This value is relative to the plugin's top-level properties.</td>
</tr>
<tr>
<td></td>
<td>If this value is set as <code>chef_cfgs</code>, the configurations are in <code>/plugins/&lt;PLUGIN_KEY&gt;/project/chef_cfgs</code>.</td>
</tr>
</tbody>
</table>

### operations/:

- Property sheet for the specific operations required by the Dynamic Environment system.

#### Properties under `operations/`:

- These operations are mapped to the plugin operations through the following child properties.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>createConfiguration/</code></td>
<td>Properties for the procedure that creates the plugin configuration. It is usually called createConfiguration.</td>
</tr>
<tr>
<td><code>deleteConfiguration/</code></td>
<td>Properties for the procedure that deletes the plugin configuration. It is usually called deleteeConfiguration.</td>
</tr>
</tbody>
</table>
Go to Example: Property Structure for a Configuration Management Plugin on page 320 for an example of the properties for the EC-Chef plugin.

3. Save the plugin file in the appropriate location on your Commander server.

4. To import the plugin file to the ElectricCommander automation platform:

   a. In the ElectricCommander platform, go to Administration > Plugins to open the Plugin Manager page.
   b. Click the Install from File/URL tab.
   c. In the File Install field, click Choose file to select the plugin file.
   d. Click Upload to install it.

      The plugin file appears in the Currently Installed tab.

   e. Find your plugin and click Promote in the Actions column to make it available for use by ElectricFlow.
5. In ElectricFlow, to create a resource template:
   a. Go to Creating Resource Templates on page 271 for the details.
   b. In the Select cloud provider field, select your plugin as the cloud provider.
   c. Enter the plugin settings in the form.
   d. Set the configuration management tool.

       Go to Creating Resource Templates on page 271 for the details.

6. In the ectool API, enter the following commands to set pre- and post-hooks linking the plugin to an application that you later deploy in a dynamic environment.
   a. To create a pre-hook, enter

   ```
   ectool createHook postConfigurationHook --hookType POST_CONFIGURATION --
   procedureName <hookProcedure> --procedureProjectName <hookProject> --
   resourceTemplateName <awsResourceTemplate> --projectName default
   ```

       where `hookProcedure` is the your plugin name, `hookProject` is the name of the project to which the plugin belongs, and `awsResourceTemplate` is the name of the resource template that you created.

   b. To create a post-hook, enter

   ```
   ectool createHook preConfigurationHook --hookType PRE_CONFIGURATION --
   procedureName <hookProcedure> --procedureProjectName <hookProject> --
   resourceTemplateName <awsResourceTemplate> --projectName default
   ```

       where `hookProcedure` is the your plugin name, `hookProject` is the name of the project to which the plugin belongs, and `awsResourceTemplate` is the name of the resource template that you created.

7. Create an environment template with the resource template that you created.

**Example: Property Structure for a Configuration Management Plugin**

This is the EC-Chef plugin property structure.

<table>
<thead>
<tr>
<th>Name</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>ec_configurationmanagement_plugin/</td>
<td></td>
</tr>
<tr>
<td>displayName</td>
<td>Chef</td>
</tr>
<tr>
<td>hasConfiguration</td>
<td>1</td>
</tr>
<tr>
<td>configurationLocation</td>
<td>chef_cfgs</td>
</tr>
<tr>
<td>operations/</td>
<td>createConfiguration/</td>
</tr>
<tr>
<td></td>
<td>deleteConfiguration/</td>
</tr>
<tr>
<td></td>
<td>converge/</td>
</tr>
<tr>
<td></td>
<td>teardown/</td>
</tr>
<tr>
<td>Name</td>
<td>Values</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>ec_configurationmanagement_plugin/createConfiguration/</td>
<td>procedureName CreateConfiguration</td>
</tr>
<tr>
<td></td>
<td>ui_formRefs/ parameterForm called forms/CreateConfigForm</td>
</tr>
<tr>
<td></td>
<td>parameterRefs/ configuration called config</td>
</tr>
<tr>
<td>ec_configurationmanagement_plugin/deleteConfiguration/</td>
<td>procedureName DeleteConfiguration</td>
</tr>
<tr>
<td></td>
<td>ui_formRefs/</td>
</tr>
<tr>
<td></td>
<td>parameterRefs/ configuration called config</td>
</tr>
<tr>
<td>ec_configurationmanagement_plugin/converge/</td>
<td>procedureName _RegisterAndConvergeNode</td>
</tr>
<tr>
<td></td>
<td>ui_formRefs/ parameterForm called ec_parameterForm</td>
</tr>
<tr>
<td></td>
<td>parameterRefs/ configuration called config</td>
</tr>
<tr>
<td>ec_cloudprovisioning_plugin/teardown/</td>
<td>procedureName _DeleteNode</td>
</tr>
<tr>
<td></td>
<td>ui_formRefs/</td>
</tr>
<tr>
<td></td>
<td>parameterRefs/ resourceName called resource_name</td>
</tr>
</tbody>
</table>

Deploying Applications With Provisioned Cloud Resources

About the example in this topic:

The example in this topic consists of an application called "Hello World" application with one application process called Test1, which has two steps.
Test1 will be deployed in a dynamic environment called *CloudEnv*. You model the CloudEnv environment using the *AWStest* environment template.

The AWStest environment template has three tiers:

- Tier 1 and Tier 3 have cloud resources defined in resource templates. These resources can be provisioned when you deploy the application.
- Tier 2 has static resources, which cannot be provisioned.

Starting in the Home page:

1. Go to the Applications List.
   - Starting from the Main menu, click the **Menu** button, and then select **Applications**.
   - Starting from the Home page, click **Applications**.

   The Applications List opens.

   **Example:**
   This example uses the "Hello World" application.

2. Choose an application, and click the **Run process** button for that application.

   **Example:**
3. Click **New Run**.

The **New** dialog box to deploy the application opens.

See the messages in this dialog box for hints about what you need to do to deploy the application.

**Example:**

![New dialog box](image)

4. Select the application process to deploy.

5. Click **Map to Environment** + to create a tier map for the application.

The **Tier Map** dialog box opens.

**Example:**

![Tier Map dialog box](image)
6. Select **Environment Template**.

The **Tier Map** dialog box to select an environment tier opens.

**Example:**

![Tier Map dialog box](image)

7. Select an environment template.

The `<Environment template>`/Tier Map dialog box opens.

8. For each application tier, click the **Menu** button to select an environment tier to which the application tier is mapped.

**Example:**

![Application Tiers and Environment Template Tiers](image)

**Example:**

![Application Tiers and Environment Template Tiers](image)
9. Click **OK**.

The *New* dialog box to deploy the application re-opens.

**Example:**

![New Dialog Box](image1)

10. Click **Select Environment** to select an environment template.

A list of available environments and environment template based on the tier map opens.

**Example:**

![Select Environment](image2)

11. Select **1 Templates**.

A list of available environment templates appears.

**Example:**

![Select Environment](image3)

12. Click the environment template that you want to use.
13. Enter a name for the dynamic environment.

The **New** dialog box to deploy the application now shows the environment template name below the application process name. It also shows the number of cloud resources provisioned in the environment templates.

**Example:**

![Image of New dialog box]

14. Click in the **Cloud Resources** row.

The **Cloud Resources** dialog box opens.

**Example:**

![Image of Cloud Resources dialog box]
15. Change the number of cloud resources to provision

**Example:**

In this example, Tier 1 and Tier 3 have one or more resources to provision because they have cloud resources. You cannot provision resources in Tier 2 because it has only static resources.

![Image of resource provisioning example]

16. Click **OK**.

The **New** dialog box now shows the new number of resources to provision.

The message "This application does not yet have an Environment to Run on" still appears.

When you click **OK**, ElectricFlow first attempts to create the dynamic environment. If this is successful, it deploys the application.

**Example:**

![Image of application deployment]

The Applications List opens.
17. To view the job details, click the **View Details** button to open to the Job Details page.

ElectricFlow first runs the job to create the dynamic environment. If this job is successful, it deploys the application.

**Example:**

![Job Details](image)

You can also see the status of jobs as they progress in the Applications List.

**Example:**

This example shows the Application List when the job starts.

![Application List](image)

If you provision resources that are not available, such as 20 cloud resources in Tier 1 and 3 static resources in Tier 2, the job to create the dynamic environment fails and the application is not deployed.

### Deploying Applications with Parameters

Starting in the Applications List:

1. Choose the application that you want to deploy and click the **Run process** button.

2. Select **New Run** to deploy the application with new settings.
   
   The **New** dialog box opens.

3. Select the application process, environment, tier map, snapshot, artifact, and resource options, as described in other topics in this document.

4. In the **Parameters** row, click the button to open a form showing the parameters that apply to the application process.

5. Enter information in the fields.

6. Click **OK** to save the parameter settings and close the form.

   The **New** dialog box now shows what you set in the previous two steps.

   The Parameters row shows the number of required parameters. You must enter information for those
parameters to deploy the application.

7. Click OK to deploy the application.

**Retiring Dynamic Environments**

After you have deployed your application in a dynamic environment, you can retire it and make the cloud resources available for other dynamic environments.

Starting in the Environments List:

1. Choose a dynamic environment.

   **Example:**

   ![Environment List Example](image)

2. Click the Tear down button for that environment.

   A message appears.

   **Example:**

   ![Retire Environment Message](image)
3. Click **OK** to verify that you want to retire the environment.

The Job Details page opens.

**Example:**

4. View the results in the Job Details page.

**Dynamic Environment Example with Amazon and Chef**

This example shows what you see in the ElectricFlow UI when your dynamic environment is configured with Amazon as the cloud provider and Chef for the configuration management.

**Resource Templates**

In resource templates, you define cloud resources that will be provisioned for dynamic environments. Examples of cloud resources are a HAPerxy server, MySQL server, PHP-FPM server, and Resque server.

This is the Resource Template List.

These are the cloud provider settings for a resource template. It is defined by cloud provider account credentials and by an Amazon Machine Image (AMI).
These are the configuration management settings for a resource template. It calls a Chef recipe to configure the cloud resources. You can configure the resources with other recipes or predefined configuration, such as a MySQL stack configuration or a HAProxy load balancer configuration.

**Environment Templates**

When you create a new environment template, you can add one resource template to an environment tier. These are the resource templates from which you can select.
After you select a resource template and click **OK**, you enter the number of resources to provision in an environment tier.

This is an environment template with four tiers. Each tier is configured with a resource template, and resource template has a provisioned resource.

**Deploying Applications to Dynamic Environments**

After you select an application to deploy, you select the application process to run and the environment in which to deploy the application.
To deploy the application in a dynamic environment, you can select an environment template. A dynamic environment is created with the provisioned cloud resources. After the resources are provisioned and the dynamic environment is created, the application is deployed.

You can view the status of the provisioning process.

**Retiring Dynamic Environments**

After the provisioning process completes, the new dynamic environment appears in the Environments List.

You can retire dynamic environments on an on-demand basis to prevent excessive use of cloud resources and reduce costs.

You click the **Tear down** button to retire the selected dynamic environment.
### Modeling and Deploying Applications in Dynamic Environments

A screenshot showing a user interface for managing environments. The interface includes a window titled "Retire this Environment?" with an ATTENTION message: "The provisioned resources will be removed from the cloud and will no longer exist." Below are the details of various environments:

<table>
<thead>
<tr>
<th>Environment ID</th>
<th>Environment Name</th>
<th>Tiers</th>
<th>Resources</th>
<th>Applications Installed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HAPROXY Tier / 4.1.1.5-PHP-QA</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>MySQL Tier / 4.1.1.5-PHP-QA-MySQL</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>hi-store dev</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A tear down button is highlighted on the interface.
Process Branching

This section describes Process Branching and how to use it.

More about application, deploy, and run:

As you use ElectricFlow, remember that these terms have different meanings within ElectricFlow and outside of ElectricFlow when you deploy your software or application:

<table>
<thead>
<tr>
<th>Term</th>
<th>Within ElectricFlow</th>
<th>Outside of ElectricFlow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>The application that you design and run (deploy) to produce your software for continuous delivery across different pipelines.</td>
<td>The software, system or application that you build, test, install, implement, release, and deploy using ElectricFlow. This is the end product of using ElectricFlow.</td>
</tr>
<tr>
<td>Deploy</td>
<td>Running the application that you designed in ElectricFlow. The end product is your software, system, or application. Deploy is a synonym of run in ElectricFlow.</td>
<td>All the processes or actions to develop and run your software in its environment, including building, testing, implementing, installing, configuring, making changes, and releasing.</td>
</tr>
<tr>
<td>Run</td>
<td>Running the application that you designed. The end product is your software, system, or application. <em>Run is a synonym of deploy in ElectricFlow.</em></td>
<td>All the processes or actions to use software in its environment, including implementing, installing, configuring, debugging, troubleshooting, and releasing.</td>
</tr>
</tbody>
</table>

About Process Branching

Starting in ElectricFlow 5.1, you can use process branching to specify the path through an application or component process based on transition conditions other than out-of-the-box options. Decisions about the next step in the process are made while the process runs. This is similar to the transition conditions for workflows in the ElectricCommander platform.

If the application or component process applies to multiple use cases, you can design one process with two or more branches instead of designing multiple processes for each use case. You can also define steps that run in parallel.

For example, to install or upgrade software, you can define one process for multiple use cases and use the same steps except for the following:
The source files can be in .zip or .tar format. The steps to extract the files depend on the format. The operating system can be Linux or Windows. The steps to download the files, install them on the server, and enter commands depend on the operating system.

ElectricFlow supports the following branching conditions. The default is **Always**.

- Completion status of the previous process step
- A property set in another part of the system, not the in the previous step
- Custom validation rules

When you define a step in an application or component process, you configure what ElectricFlow does when an error occurs. You select **stop running** or **continue running** in the On Error field in the Define Step dialog box. *This setting overrides any job-step-level branching condition.* If an error occurs in a job step and the **stop running** is set, ElectricFlow aborts even if the branching condition is fail.

**How to Use the Process Branching UI**

**How to get to the Application Process Visual Editor:**

- Existing application process: From the Applications Visual Editor, click the down-arrow button and select an application.
  
The Application Process Visual Editor for that application process appears.

- New application process: From the Applications Visual Editor, click the **Add application process** button, set the parameters in the **Application Process Details** dialog box, and click **OK**.
  
The Application Process Visual Editor for the application process appears.

**How to get to the Component Process Visual Editor:**

- Existing component process: From the Applications Visual Editor, click the **Number of component processes** button, and select a component process in the drop-down list.
  
The Component Process Visual Editor for that component process appears.

- New component process: From the Applications Visual Editor, click the **Add component process** button to a component, set the parameters in the **Component Process Details** dialog box, and click **OK**.
  
The Component Process Visual Editor for the component process appears.

**UI Objects**

This example shows how a process appears in the ElectricFlow UI.
The process has these UI objects:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| **1** | Click the plus sign (+) to add a step after the selected step.  
In this example:  
- When you click the plus sign, a new step is added after the Start and parallel to the existing next step called Deploy War.  
- The steps immediately after the "Deploy War" step are parallel steps. The decision about the next step, either the "Start Server" or the "Send Email" step, depends on the branching condition. The results of the "Deploy War" step determine what the next step is.  
  - If the results of the "Deploy War" step are successful (shown by the square green connector), the next step is the "Start Server" step.  
  - If the results fail (shown by the circular red connector), the next step is the "Send Email" step.  |
| **2** | Connector between two objects in the process. The default branching condition is Always.  
When you click the connector, the branching conditions menu opens.  |
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 3 | Link between two steps in the process.  
The link goes from the source step to the target step. |
| 4 | Source—The link starts at this step.  
For the link between the "Deploy War" and the "Send Email" steps, the source is the "Deploy War" step. |
| 5 | Target—The link ends at this step.  
For the link between the "Deploy War" and the "Send Email" steps, the source is the "Send Email" step. |
| 6 | The branching condition is **Successful**.  
If the War file is run successfully in this example, the next step is Start Server. |
| 7 | The branching condition is **Failure**.  
If the file is not run in this example, the application fails and the next step is to send an email to the administrator. |

**Branching Conditions Menu**

When you click a connector on a link, the branching conditions menu opens. Depending on the location of the connector, some of the menu options may not be available. These are possible branching conditions:

- **Always**—Always go to the next step, referred to as the target.
- **Successful**—Go to the next step if the previous step, referred to as the source, is successful.
- **Failure**—Go to the next step if the previous step fails.
- **Add Condition**—Add a custom condition.
- **Add Connector**—Add a connector from the source of the link to a new target by selecting one of the highlighted eligible steps. You can only select an eligible step.
- **Change Source**—Change the source by selecting one of the highlighted eligible steps, which has a red outline. You can only select an eligible step.
- **Change Target**—Change the target by selecting one of the highlighted eligible steps, which has a red outline. You can only select an eligible step.
- **Delete**—Delete the selected connector and link.

For example, when you select the connector between the Start and "Deploy War" steps, only some of conditions appear and only some are available. The condition between the Start and the next step is **Always**, the default branching condition.
When you select the connector between the "Deploy War" and "Start Server" steps, all of these conditions appear.
Analysis of a Process With Simple Branching

This example shows a process with simple branching that runs the War file. For the steps to design this example, see Simple Process Branching Example on page 348.
The branching condition is **Successful**.
If the War file is run successfully, the next step is Start Server.

The branching condition is **Failure**.
If the file is not run successfully, the application fails and the next step is to send an email to the administrator.

The branching condition is **Always**.

The example has the following job-step branching dependencies:

<table>
<thead>
<tr>
<th>Source</th>
<th>Target</th>
<th>Branching Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deploy War</td>
<td>Start Server</td>
<td>Successful</td>
</tr>
<tr>
<td>Deploy War</td>
<td>Send Email</td>
<td>Failure</td>
</tr>
</tbody>
</table>
Process Branching States and Conditions

State of the Branching Condition Connectors in the UI

In the ElectricFlow UI, the status of the link is based on the shape and color of the connector.

<table>
<thead>
<tr>
<th>Shape</th>
<th>Color</th>
<th>Link Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diamond</td>
<td>Light gray</td>
<td>Always</td>
</tr>
<tr>
<td>Diamond</td>
<td>Dark gray</td>
<td>Disabled</td>
</tr>
<tr>
<td>Square</td>
<td>Green</td>
<td>Successful</td>
</tr>
<tr>
<td>Circle</td>
<td>Red</td>
<td>Failure</td>
</tr>
</tbody>
</table>

Examples of Branching Conditions

These are examples of branching conditions that you can apply in your processes.

- Based on the status of the previous step

  Follow the branch based on the result of the previous step: Successful, Failure, or both (Always).

  Example:
  - **Successful**– If the file is downloaded successfully, the next step is to extract the files.
  - **Failure**– If the file was not downloaded properly, the next step is to abort the process.
  - **Always**– The next step is to always extract the files.

- Based on a value of an operation during the step

  Follow the branch that matches the result of an operation such as calculating a value or processing data during the step.

  Example: The result of an operation is a file type.
  - If the result is an XML zip file, the next step is open an XML text editor.
  - If the result is a .htm file, open a web browser.
  - If the result is a .mov, open an application to play the movie.
• Based on a property in another part of the system

Follow the branch based on a property set in another part of the system, not in the previous process step.

Example:

• If the property os_type = linux is set on a resource, always follow the branch for Linux steps.

• If the property release_type is set to minor in the application, always follow the branch for minor releases when running the process.

Custom Conditions in Process Branching

How to get here: In a component or application process with branching, click the connector on a link to open the branching options menu.

In this example, click the connector between the "Deploy War" and "Start Server" steps, and select Add Condition to add a custom condition.
The Condition dialog box opens.
When you click the connector between the "Deploy War" and "Start Server" steps, these conditions appear:

- **Always**—Always go to the next step, referred to as the target.
- **Successful**—Go to the next step if the previous step, referred to as the source, is successful.
- **Failure**—Go to the next step if the previous step fails.
- **Add Condition**—Add a custom condition.
- **Add Connector**—Add a connector from the source of the link to a new target by selecting one of the highlighted eligible steps. You can only select an eligible step.
- **Change Source**—Change the source by selecting one of the highlighted eligible steps, which has a red outline. You can only select an eligible step.
- **Change Target**—Change the target by selecting one of the highlighted eligible steps, which has a red outline. You can only select an eligible step.
- **Delete**—Delete the selected connector and link.

After you configure your conditions, they appear near the affected connectors in the process.
When you configure a **Property based** condition, the fields in the Condition dialog box remain the same.

When you configure a **Custom** condition, the fields change.
Configuration Guidelines for Process Branching

Follow these guidelines when you use process branching in your application or component processes.

- When you add a step, you must define it before adding another step.
- You can only configure branching conditions on a connector between two process steps.
- You cannot configure branching conditions between these objects:
  - The start of the process and the steps immediately after it.
  - The end of the process and the steps immediately before it.
- You cannot configure branching conditions between these objects:
  - The start of the process and the steps immediately after it.
  - The end of the process and the steps immediately before it.
- When you define a step in an application or component process, you configure what ElectricFlow does when an error occurs.

Select **stop running** or **continue running** in the **On Error** field in the Define Step dialog box. *This setting overrides any job-step-level branching condition.*

If an error occurs in a job step and the **stop running** is set, ElectricFlow aborts even if the branching condition is set to Failure.

Simple Process Branching Example

**How to get to the Application Process Visual Editor:**

- Existing application process: From the Applications Visual Editor, click the number-and-down-arrow button and select an application. The Application Process Visual Editor for that application process appears.
- New application process: From the Applications Visual Editor, click the **Add application process** button, set the parameters in the **Application Process Details** dialog box, and click **OK**. The Application Process Visual Editor for the application appears.

**How to get to the Component Process Visual Editor:**

- Existing component process: From the Applications Visual Editor, click the **Number of component process** button, and select a component process in the drop-down list. The Component Process Visual Editor for that component process appears.
- New component process: From the Applications Visual Editor, click the **Add component process** button to a component, set the parameters in the **Component Process Details** dialog box, and click **OK**. The Component Process Visual Editor for the component process appears.

This example shows how to design a new process and run the War file.

- If the application succeeds, ElectricFlow starts the server.
- If the application fails, ElectricFlow sends an email to the administrator.

Beginning in the Application Process or Component Process Visual Editor:
1. Click the button below "Define this Step."
   The process step dialog box appears.

2. Configure the step.
   The first step is now configured.
3. To add a step below the first step, click the plus sign (+) below the tier name in the first step. A new undefined step appears below the first step.
4. Define the new step.
5. To add a step that will be parallel to the second step, click the plus sign in the first step.

A new undefined step appears below the first step and parallel to the second step.
6. Define the third step.
7. To configure the branching condition between the "Deploy War" step and the "Start Server" step, click the connector between them.

The branching conditions menu opens.

For the "Start Server" step, select **Successful**.
8. To configure the branching condition between the "Deploy War" step and the "Send Email" step, click the connector between them, and select **Failure** in the branching conditions menu.

**Process Branching Example: Deleting Steps**

This example shows how a process changes when you delete process steps.
Deleting Step 3

To delete Step 3:

1. Click the **Edit** button on Step 3.
   
The step details menu appears.

2. Click **Delete**.
   
The Step Deletion dialog box appears.

3. Click **OK** to delete the step.

When you delete Step 3, Step 2 becomes the source for Step 4 and Step 5.
Deleting Step 7

Step 1 becomes the source for Step 6.
Deleting Step 2

Step 1 becomes the source for Step 3.
Change Tracking

ElectricFlow tracks the changes to tracked entities in objects including applications, procedures, workflows, workspaces, resources, and project-owned components such as library components and records a change history of the historical states of the system and the changes between them.

Using Change Tracking with snapshots makes it easier to deploy reliable and repeatable software in a continuous delivery cycle.

In the Change History, you can do the following:

- When you are debugging a failed job or want to more information about a component, see the change history for the changes relevant to that object.
- When you search for specific change history records, filter the records by time frame, change type, entity type, or developer.
- Revert changes to an object or to an objects and its children.
- When you want to determine the differences between objects, export them at various levels in the object hierarchy.

More about application, deploy, and run:

As you use ElectricFlow, remember that these terms have different meanings within ElectricFlow and outside of ElectricFlow when you deploy your software or application:

<table>
<thead>
<tr>
<th>Term</th>
<th>Within ElectricFlow</th>
<th>Outside of ElectricFlow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>The application that you design and run (deploy) to produce your software for continuous delivery across different pipelines.</td>
<td>The software, system or application that you build, test, install, implement, release, and deploy using ElectricFlow. This is the end product of using ElectricFlow.</td>
</tr>
<tr>
<td>Deploy</td>
<td>Running the application that you designed in ElectricFlow. The end product is your software, system, or application. Deploy is a synonym of run in ElectricFlow.</td>
<td>All the processes or actions to develop and run your software in its environment, including building, testing, implementing, installing, configuring, making changes, and releasing.</td>
</tr>
<tr>
<td>Run</td>
<td>Running the application that you designed. The end product is your software, system, or application. Run is a synonym of deploy in ElectricFlow.</td>
<td>All the processes or actions to use software in its environment, including implementing, installing, configuring, debugging, troubleshooting, and releasing.</td>
</tr>
</tbody>
</table>
Configuring Change Tracking

Change Tracking must be enabled when ElectricFlow starts for your system to track changes and record the change history.

By default, Change Tracking is enabled.

Enabling Change Tracking Globally

When you are installing ElectricFlow:

1. Add this line to the database.properties file:

   \[ \text{COMMANDER_DB_AUDITING_ENABLED=true} \]

2. Restart the ElectricCommander server.

Enabling Change Tracking on a Per-Project Basis

In the ElectricCommander UI:

Change Tracking is enabled by default on a project:

To disable Change Tracking, click to clear the Enable Change Tracking check box and click OK.

In ectool:

- Enter `ectool modifyProject <projectName> --tracked true` to enable Change Tracking.
- Enter `ectool modifyProject <projectName> --tracked false` to disable Change Tracking.

In ec-perl:

- Enter `$cmdr->modifyProject(<projectName>, {tracked => true});` to enable Change Tracking.
- Enter `$cmdr->modifyProject(<projectName>, {tracked => false});` to disable Change Tracking.
Upgrading to ElectricFlow 5.4

Change Tracking is enabled when you upgrade to ElectricFlow 5.4. This can significantly increase the time it takes to complete the upgrade.

If you want to upgrade with Change Tracking disabled, add this line to the database.properties file before starting the upgrade:

```plaintext
COMMANDER_DB_AUDITING_ENABLED=false
```

Customizing the Change History Page

The performance of the Change Tracking feature is affected by number of records in the Change History as well as the number of entries being tracked. For example, a page showing 5000 entries may be slow to load and update and does not provide much useful information.

These Commander server uses the lowest of the following limits to determine the maximum amount of records to display in the Change History page:

- Maximum amount of records on the Change History page
  
  To change the maximum number of records in the Change History page:

  1. Set the `CHANGE_TRACKING_HARD_MAX_RECORDS` parameter in the `wrapper.conf` file to a new value.

     The default value is 1000.

  2. Restart the ElectricCommander server.

- Maximum number of records retrieved

  Set the `TrackingMaxRecords` server setting to a new value not exceeding the `CHANGE_TRACKING_HARD_MAX_RECORDS` parameter in the `wrapper.conf` file.

  To set `TrackingMaxRecords`, do one of the following:

  Change the value in the UI. See the Server Settings page in the ElectricCommander automation platform UI.

  Use `ectool` to change the value. For example, enter the following command to limit the number of records retrieved to 100:

  ```plaintext
  ectool setProperty /server/settings/changeTrackingMaxRecords --value 100
  ```

Usage Guidelines

Be aware of these known issues:

- You can ignore warnings about Change Tracking in the log file that start with the "Unable to safely follow an Acl parent chain upwards while trying to figure out whether to have Envers audit an Acl" string. These warnings are added to the log file when Change Tracking is enabled and running.

- The `beforePATH` and `afterPATH` values in the change history records for the deletion of objects are often incorrect or missing.

Viewing the Change History

You can open and view the change history from the following objects in ElectricFlow:
• Applications List
• Applications Visual Editor
• Application Process Designer
• Artifacts
• Component
• Component Process Designer
• Environments Designer
• Environment Tier
• Jobs
• Process Step (Application or Component)
• Projects
• Resources
• Workflows

**Related Topics:**

- Viewing the Change History from the Applications List on page 364
- Viewing the Change History from the Applications List on page 364
- Viewing the Change History for Artifacts, Jobs, Projects, and Workflows on page 372

**Viewing the Change History from the Applications List**

You may want to view the Change History for these objects in an application:

• An application process that did not run successfully

![Image](image1.png)

• Component or component process in an application process that did not run successfully

![Image](image2.png)

• Resource that was not deployed successfully

![Image](image3.png)
Starting from the Home page:

1. Go to the Applications List.
2. Choose an application.
3. Click the View button.

   **Example:**

   ![View button]

   A list of the application processes for the application appear.

4. To view the Change History of an application process:
   
   a. Choose a process.
   
   b. Click the Change History button.

   **Example:**

   ![Change History button]

   The Change History for the application process opens.

5. To view the change history for an object in the application process,

   a. Click the View Details button.

      A list of objects in the application process (components and component processes) appears, and the breadcrumb changes to Applications/View Run.

   b. Choose an object.

   c. Click the Change History button to see the change history for the object.

**Viewing the Change History From an Application or Environment**

You may want to view the Change History for these objects:

- An application in the Application Visual Editor on page 366
- An application process and process step in the Applications Visual Editor on page 38
- A component process and process step in the Component Process Visual Editor on page 368
- An environment in the Environments Visual Editor on page 370
- Resources in the Environment Tier on page 371
Application Visual Editor

1. Go to the Applications List.
2. Select an application.
   The Applications Visual Editor opens.
3. Click the Menu button.
   
   Example:

   ![Menu button example](image)

4. Select **Track Changes**.
   The Change History for the object opens.
   The default time increment is **Past 60 Minutes**.

   Example:

```
+-----------------+-----------------+-----------------+-----------------+-----------------+
| Change          | What            | Name            | By              | Change          |
+-----------------+-----------------+-----------------+-----------------+-----------------+
|                 | Application     | petstore1.5     | admin           | Created         |
|                 | property        | ec_purchasestatus| admin           | Created         |
|                 | property        | ec_productprice | admin           | Created         |
|                 | property        | ec_orderstatus  | admin           | Created         |
|                 | property        | ec_inventory    | admin           | Created         |
|                 | property        | ec_store        | admin           | Created         |
|                 | property        | ec_customer     | admin           | Created         |
|                 | property        | ec_productprice | admin           | Created         |
|                 | property        | ec_orderstatus  | admin           | Created         |
|                 | property        | ec_inventory    | admin           | Created         |
|                 | property        | ec_store        | admin           | Created         |
|                 | property        | ec_customer     | admin           | Created         |
|                 | property        | ec_productprice | admin           | Created         |
|                 | property        | ec_orderstatus  | admin           | Created         |
|                 | property        | ec_inventory    | admin           | Created         |
|                 | property        | ec_store        | admin           | Created         |
|                 | property        | ec_customer     | admin           | Created         |
|                 | property        | ec_productprice | admin           | Created         |
|                 | property        | ec_orderstatus  | admin           | Created         |
|                 | property        | ec_inventory    | admin           | Created         |
|                 | property        | ec_store        | admin           | Created         |
|                 | property        | ec_customer     | admin           | Created         |
|                 | property        | ec_productprice | admin           | Created         |
|                 | property        | ec_orderstatus  | admin           | Created         |
|                 | property        | ec_inventory    | admin           | Created         |
|                 | property        | ec_store        | admin           | Created         |
|                 | property        | ec_customer     | admin           | Created         |
|                 | property        | ec_productprice | admin           | Created         |
|                 | property        | ec_orderstatus  | admin           | Created         |
|                 | property        | ec_inventory    | admin           | Created         |
|                 | property        | ec_store        | admin           | Created         |
|                 | property        | ec_customer     | admin           | Created         |
|                 | property        | ec_productprice | admin           | Created         |
|                 | property        | ec_orderstatus  | admin           | Created         |
|                 | property        | ec_inventory    | admin           | Created         |
|                 | property        | ec_store        | admin           | Created         |
|                 | property        | ec_customer     | admin           | Created         |
|                 | property        | ec_productprice | admin           | Created         |
|                 | property        | ec_orderstatus  | admin           | Created         |
|                 | property        | ec_inventory    | admin           | Created         |
|                 | property        | ec_store        | admin           | Created         |
|                 | property        | ec_customer     | admin           | Created         |
```

1. Go to the Applications List.
2. Select an application.
   The Applications Visual Editor opens.
3. Select an application process.
   The Application Process Visual Editor opens.
4. To view the Change History for the application process:
   a. Click the Menu button.
      
      **Example:**
      
      [Menu button image]

   b. Select Track Changes.

      The Change History for the application process opens.

      The default time increment is **Past 60 Minutes**.

      **Example:**
      
      ![Change History interface example]
5. To view the Change History for the application process step:
   a. Choose a step.
   b. Click the **Edit** button in the step to open the context menu.

   **Example:**

   ![Example Image]

   c. Select **Track Changes**.

   The Change History for the application process step opens.

   The default time increment is **Past 60 Minutes**.

   **Example:**

   ![Change History Example]

**Component Process Visual Editor**

1. Go to the Applications List.
2. Select an application.

   The Applications Visual Editor opens.
3. Choose a component.
4. Select a component process for the component.

   The Component Process Visual Editor opens.
5. To view the Change History for the component process:
   a. Click the **Menu** button.
      
      **Example:**

      ![Menu button]

   b. Select **Track Changes**.
      
      The Change History for the component process opens.
      
      The default time increment is **Past 60 Minutes**.
      
      **Example:**

      ![Change History example]
6. To view the Change History for the component process step:
   a. Choose a step.
   b. Click the Edit button in the step to open the context menu.

   **Example:**

   ![Change History]

   c. Select **Track Changes**.

   The Change History for the component process step opens.

   **Example:**

   ![Change History Table]

**Environments Visual Editor**

1. Go to the Environments List.
2. Select an environment.

   The Environments Visual Editor opens.
3. Click the **Menu** button.

   **Example:**

   ![Menu Button]
4. Select Track Changes.
   The Change History for the object opens.

   **Example:**

   ![Change History](image)

   **Environment Tier**

   1. Go to the Environments Designer.
   2. Choose an environment tier.
   3. Click the Menu button.

   **Example:**

   ![Menu Button](image)

   4. Select Track Changes.
   The Change History for the object opens.
   The default time increment is **Past 60 Minutes**.

   **Example:**

   ![Change History for Database](image)
Viewing the Change History for Artifacts, Jobs, Projects, and Workflows

When troubleshooting why a job failed, you can view the Change History for artifacts, jobs, projects, and workflows in the ElectricCommander platform.

- **Artifacts** on page 372
- **Jobs** on page 373
- **Projects** on page 375
- **Workflows** on page 375

**Artifacts**

Starting from the Home page:

1. Go to the Artifacts tab.
2. Choose an artifact.
3. Click **Track Changes**.

   Example:

   ![Artifacts screenshot]

   The Change History for the selected artifact opens.

   The default time increment is **Past 60 Minutes**.

   Example:

   ![Change History screenshot]
Jobs

Starting from the Home page:

1. To go to the Job Details page, do one of the following:
   - Use the Jobs tab.
   - Use the Jobs Quick View list.

2. If you use the Jobs tab, follow these steps:
   a. Click the Jobs tab.

   The Jobs page opens.

   ![Jobs Tab](image)

   Example:

   ![Job Details](image)

   b. Click a job name to select a job.

   The Job Details page opens.

   Example:
3. If you use the Jobs Quick View list, click a job name to select a job.

Example:

The Job Details page opens.

Example:

4. Choose a job or job step.
5. Click **Track Changes** for the job or job step.

The Change History for the job or job step opens.

The default time increment is **Past 60 Minutes**.

Example:

![Image of Change History](image1)

### Projects

Starting from the Home page:

1. Go to the Projects tab.
2. Choose a project.
3. Click **Track Changes**.

The Change History for the project opens.

Example:

![Image of Projects](image2)

### Workflows

Starting from the Home page:

1. Go to the Workflows tab.
2. Choose a workflow.
3. Click **Track Changes**.

The Change History for the workflow opens.
Change History Page

How to get here: Click the Search button to open the "Change History - Search" form, and enter the search criteria.

The search results appear in the Change History page and include the following information:

How to get here:

From the Home page in the ElectricCommander platform, use one of the following methods to open and view the change history for jobs, projects, workflows, and artifacts:

- Select a job that failed > Click the job name to go to the Job Details page > Click Track Changes in the upper right of the page.
- Click the Jobs tab > Select a job that failed to the Job Details page > Click Track Changes in the upper right of the page.

The search results appear in the Change History page for the job and include the following information:
|   | Time range.  
The end time is the current time. You can change the end time after you run the search and get the search results. |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Name of the tracked object.</td>
</tr>
</tbody>
</table>
| 3 | Path to the tracked object.  
Example: |
| 4 | After making a change, you can revert or export the object. Click this to go to the undo or redo the last action on the page. |
| 5 | Click this to run a new change history search. |
| 6 | Time line.  
The start time is based on the time range that you selected.  
The end time is the current time.  
You can manually change the start and end times after you run the search and get the search results. |
Filters for the change history.
You can view all changes or view only selected changes.
The objects in the list are the objects in the change history search results.

Change history for the selected object.
- **When**—the date and time that the object changed.
- **What**—The type of object.
- **Name**—The name of the object.
- **By**—The "user" that changed the object, which can be a project or a user.
- **Change**—The type of change.
- **Path**—Click the **View Path** button to see the path to the object.

Click the **View** button to see more details about the object.

**Time Line**
The time line for the change history is at the top of the Change History page.
The time line is automatically separated into divisions based on the number of minutes, hours, or days between the end time and the start time.

**Default Settings**
These are the default settings for the time line:
- The start time is the selected time range in the upper left of the page.
- The end time is **Most Recent** when the latest change to the object occurred.
- The default range is from the **Last Successful Run** to the **Most Recent**.
- The entire time line is displayed, and all the changes are in the list below the time line.

The time line on this page has the default range.
**Note:** The **Last Successful Run** range is available only after the first time that you run an application.
When the range is changed to **Past 60 Minutes**, the time line changes:

- The start time is 60 minutes from **Now**.
- The end time is when the **Most Recent** change occurred (**Now**).
- The time line has four divisions.

If the increment is **Past 7 Days**, the time line has seven one-day divisions.

You can view the change history in different ways depending on the time range for the time line.

**Selecting the Time Range**

You can view the change history in different ways depending on the time range for the time line. Click the down arrow next to the time range to select a different range for the change history.

You can see the change history since the last successful run. Notice that the information on the left side shows a summary of the changes, which is a subset of the results that you got.
Moving the Start and End Times

You can manually move the start and end times on the time line.

When you move the start time to 18:00 and the end time to 6:00, notice that the list of objects in the change history changes.

Specifying the Time Range

Example:
To manually set the times and dates for the start and end times:

1. Select **Between**.

A drop down dialog box opens.

**Example:**

![Example of Change Tracking]

![Example of Change Tracking]

![Example of Change Tracking]
2. Select the time and date for the start of the time line.
   The default settings are 3:30 pm and eight days before the current date.

   **Example:**

   ![Example Time Line]

3. Click **OK**.
   A drop down dialog box opens at the other end of the time line.

   **Example:**

   ![Example Time Line End]
4. Select the time and date for the end of the time line.

The defaults are 3:30 pm and the current date.

Example:

![Example Image]

5. Click **OK**.

The time line changes to show only the changes from the start and end times and dates that you selected.

Example:

![Example Image]

**Number of Changes**

The time range at the top of the change history shows the number of changes.
- There have been 233 changes in the last 24 hours.
- There have been 213 changes in the last 12 hours.
- There have been 20 changes in the last 6 hours.

When you change the time range, the number of changes also changes. In the last 60 minutes, there have been only two changes.

Paths to Objects

Click the View Path button next to the "Change History for JPetStore" title to see the path to the application.

Click the View Path button to see the change in the path to the object before and after the change.

Detailed Object Changes

Click the View button to see the change in the property called jobcounter.
Filters

You can use filters to view changes to specific objects, the types of changes, and the users how made those changes.

Instead of selecting View All Changes, you can select specific objects, such as only properties, processes, property sheets, process steps, and process dependencies that have been modified by the Project:Default and Admin users.

When the list of filter criteria is long, not all of the criteria may appear in the filter list. To see all of the criteria, use the up or down arrows to see all the options.

This list does not show all of the users. Use the up and down arrows to see all four of the users.
Click the down arrow to see the other users.

Modifying the Change History

You can modify the information that appears in the Change History with these settings:

- Time increment—Go to Change History Time Line on page 387.
- Time line—Go to Change History Time Line on page 387.
- Filters—Go to Change History Filters on page 393.

Related Topics:
Change History Page on page 84
Change History Page on page 84

Change History Time Line

The time line is at the top of the Change History page.

This example shows the following information about the object called JPetStore.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Time increment. The default is <strong>Last Successful Run</strong>. Click the down arrow to select another time increment:</td>
</tr>
<tr>
<td>2</td>
<td>The system automatically calculates the minutes, hours, and days since the last successful run. In the example, the last successful run occurred 60 minutes ago. The time line is divided into four 15-minute subdivisions.</td>
</tr>
<tr>
<td>3</td>
<td>Total number of changes in the selected time increment.</td>
</tr>
<tr>
<td>6</td>
<td>The number of changes that occurred from 30 minutes ago to now is 75.</td>
</tr>
<tr>
<td>4</td>
<td>Filters for the change history. You can view all changes or view only selected changes. The objects in the list are the objects in the change history search results.</td>
</tr>
<tr>
<td>5</td>
<td>When you click the change number, the Change History is updated and shows only those changes.</td>
</tr>
<tr>
<td>6</td>
<td>Drag the start and end time markers to view specific changes.</td>
</tr>
</tbody>
</table>

**Default Settings**

The default time increment is **Last Successful Run**.
Note: The Last Successful Run option is available only after the first time that you run an application. The entire time line is displayed, and all the changes are in the list below the time line.

Number of Changes

The time line shows the number of changes throughout the time increment. In the following example:

- There have been 233 changes in the last 24 hours.
- There have been 213 changes in the last 12 hours.
- There have been 20 changes in the last 6 hours.

When you change the time increment, there have been two changes in the previous 60 minutes.

Time Increment

The system automatically determines how the time line is divided for the selected time increment. When the range is changed to Past 60 Minutes, the time line changes:

- The start time is 60 minutes from Now.
- The end time is when the Most Recent change occurred (Now).
- The time line has four divisions.
If the increment is **Past 7 Days**, the time line has seven one-day divisions.

**Moving the Start and End Times Manually**

You can manually move the start and end times on the time line.

When you move the start time to 18:00 and the end time to 6:00, the list of objects in the change history changes.

**Setting Custom Time Increments**

Example:
To set other time increments, use the **Between** option:

1. **Select Between.**
   
   A drop down dialog box opens.
   
   **Example:**
2. Select the time and date for the start of the time line.

The default settings are 3:30 PM and eight days before the current date.

Example:

3. Click **OK**.

A drop down dialog box opens at the other end of the time line.

Example:
4. Select the time and date for the end of the time line.
   
   The defaults are **3:30 PM** and the current date.

   **Example:**

   ![Time and Date Selection](image)

5. **Click OK.**
   
   The time line changes to show only the changes from the start and end times and dates that you selected.

   **Example:**

   ![Change History](image)
**Change History Filters**

You can use filters to view changes to specific objects, the types of changes, and the users how made those changes.

Instead of selecting **View All Changes**, you can select specific objects, such as only properties, processes, property sheets, process steps, and process dependencies that have been modified by the Project:Default and Admin users.

When the list of filter criteria is long, not all of the criteria may appear in the filter list. To see all of the criteria, use the up or down arrows to see all the options.

This list does not show all of the users. Use the up and down arrows to see all four of the users.

Click the down arrow to see the other users.
Reverting and Exporting Changes to Objects

Starting in ElectricFlow 5.3, you can revert or exporting changes that were made to an object and to an objects and its children.

Follow these steps to select the changes that you want to revert:

1. Go to the Change History.
2. Configure the filters to view specific changes in the Change History.
   - If View All Changes is selected, click it to remove the check mark next to it.
   - Select only the objects, change types, and the users or groups who made the changes. A check mark appears next to the filter criteria that you select.
   - While selecting changes, make sure to be aware of the number of changes.
3. Choose an object in the Change History.
4. Click the **View** button to view the change details.

**Example:**

```
[Diagram]
```

This information appears:

- Name of the child object (**Column Changed**)
- State of the child object before the change (**From**)
- State of the child object after the change (**To**)
- Current state of the child object (**Current state**).

**Example:**

```
<table>
<thead>
<tr>
<th>Name of the child object (Column Changed)</th>
<th>State of the child object before the change (From)</th>
<th>State of the child object after the change (To)</th>
<th>Current state of the child object (Current state)</th>
</tr>
</thead>
</table>

```

5. Choose a change to revert.
6. In the **To** column, select the row of the object that you want to revert.

   **Example:**

   ![Example table]

   The Revert button is now available (enabled).

   **Example:**

   ![Revert button icon]

   The Export changes button is now available (enabled).

   **Example:**

   ![Export button icon]

   Repeat this step for each change that you want to revert or export.
7. To revert the changes, do the following steps:
   
a. Click the Revert button.
   
   A message confirming that you want to revert the selected object appears.
   
   Example:

   ![Reversion message]

   b. If you want to revert the selected changes, click **OK**.
      
      If the changes are successfully reverted, a message that the current state of the selected objects are successfully reverted appears.
      
      If the changes are not successfully reverted, a message that the current state of the selected objects are not successfully reverted appears.
      
   c. If you do not want to revert the selected changes, click **Cancel**.

8. Click the Export changes button to export the changes to an XML file.

### Searching Through the Change History

Use one of these methods to search through the change history:

- Running a New Search Through the Change History in the ElectricCommander Platform UI on page 404
- Searching Through the Change History From an Existing Change History on page 411

### Running a New Search Through the Change History

Follow these steps to start a search through the Change History.

Starting from the Home page:

1. Click the **Search** button.

   **Example:**
The **Change History - Search** dialog box opens.

**Example**

![Change History - Search dialog box](image)

2. Click the down arrow in the Time Increment field to open the drop-down list.

**Example:**

![Change History - Search dialog box with drop-down list](image)
3. (Optional) If you want to use a time increment longer than three days, do the following:

   a. Click **Select Date**.

      The Date Picker opens.

      **Example:**

      ![Example of Select Date](image-url)
b. Select a date.

**Example:**

The Date Picker closes and the date that you selected appears in the Time Increment field.

**Example:**
4. Click **Multiple Select** to open the drop-down list of tracked objects.

**Example:**
5. Select the objects to include in the Change History.

**Example:**

![Change History - Search](image)

6. Enter the search criteria.

As you type, the system starts to search for objects that match your search criteria.

A list of objects matching your search criteria appears in the results section.

**Example:**

![Change History - Search](image)
7. Select an object in the list.

**Example:**

![Change History - Search](image1)

<table>
<thead>
<tr>
<th>Process Dependency</th>
<th>Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>ec_deploy</td>
<td>projects/Default/applications/JPetStore/processes/deploy/proc...</td>
</tr>
<tr>
<td>s2</td>
<td>projects/Default/applications/Test/components/Comp/process...</td>
</tr>
<tr>
<td>ec_acm-run</td>
<td>projects/Default/applications/JPetStore/processes/deploy/form...</td>
</tr>
<tr>
<td>s2</td>
<td>projects/Default/applications/Test/components/Comp/process...</td>
</tr>
<tr>
<td>jpetstore</td>
<td>projects/Default/applications/jpetstore</td>
</tr>
<tr>
<td>jpetstore</td>
<td>projects/Default/applications/jpetstore</td>
</tr>
<tr>
<td>deploy</td>
<td>projects/Default/applications/JPetStore/processes/deploy/proc...</td>
</tr>
<tr>
<td>ec_notifierstatus</td>
<td>projects/Default/applications/JPetStore/processes/deploy/proc...</td>
</tr>
<tr>
<td>s2</td>
<td>projects/Default/applications/Test/components/Comp/process...</td>
</tr>
<tr>
<td>jobcounter</td>
<td>projects/Default/applications/JPetStore/jobcounter</td>
</tr>
<tr>
<td>ec_deploy</td>
<td>projects/Default/applications/JPetStore/processes/deploy/proc...</td>
</tr>
<tr>
<td>ec_acm-version</td>
<td>projects/Default/applications/JPetStore/processes/deploy/form...</td>
</tr>
</tbody>
</table>

The change history for the object that you selected appears.

**Example:**

![Change History for JPetStore](image2)
Running a New Search Through the Change History in the ElectricCommander Platform UI

Follow these steps to start a search through the Change History.

In the ElectricCommander platform:

1. **Click Change History.**

   Example:

   ![Change History](image1)

2. The Change History - Search dialog box opens.

   Example:

   ![Change History - Search](image2)

3. Click the down arrow in the Time Increment field to open the drop-down list.

   Example:

   ![Change History - Search](image3)
4. Select a time increment.

Example:

![Change History - Search]

If you want to select a time increment longer than three days, go to the next step.
5. (Optional) If you want to use a time increment longer than three days, do the following:

   a. Click **Select Date**.

   The Date Picker opens.

   Example:
b. Select a date.

Example:

The Date Picker closes and the date that you selected appears in the Time Increment field.

Example:

6. Click **Multiple Select** to open the drop-down list of tracked objects.

Example:
7. Select the objects to include in the Change History.

Example:
8. **Enter the search criteria.**

As you type, the system starts to search for objects that match your search criteria.

A list of objects matching your search criteria appears in the results section.

**Example:**

```
<table>
<thead>
<tr>
<th>Access Control Entry</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ec-klocwork</td>
<td>/plugins/ec-klocwork</td>
</tr>
<tr>
<td>workspaces</td>
<td>/systemObjects/workspaces</td>
</tr>
<tr>
<td>ec-klocwork-1</td>
<td>/plugins/ec-klocwork-1</td>
</tr>
<tr>
<td>workspaces</td>
<td>/systemObjects/workspaces</td>
</tr>
<tr>
<td>ec-klocwork-2</td>
<td>/plugins/ec-klocwork-2</td>
</tr>
<tr>
<td>workspaces</td>
<td>/systemObjects/workspaces</td>
</tr>
<tr>
<td>workspaces</td>
<td>/systemObjects/workspaces</td>
</tr>
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</tr>
<tr>
<td>workspaces</td>
<td>/systemObjects/workspaces</td>
</tr>
<tr>
<td>workflows/pagesearch</td>
<td>/users/admin/userSettings/savedSearches/workflows/pagesearch</td>
</tr>
<tr>
<td>html_statetemplate_fullwork...</td>
<td>/server/rc_notifierTemplates/html_statetemplate_fullworkflow</td>
</tr>
</tbody>
</table>
9. Select an object in the list.

Example:

The change history for the object that you selected appears.

Example:

The selected object has no changes in the default time increment. You can change the time increment to show more changes to the selected object.

Example:
In the ElectricCommander platform, you can start a search through the Change History

**Searching Through the Change History From an Existing Change History**

Follow these steps to search through the Change History from an existing Change History.

Starting from the Change History:

1. Click the **Search** button.

   **Example:**

   ![Search Button Example](image)

   The **Change History - Search** dialog box opens.

   **Example**

   ![Change History - Search Dialog](image)

2. Click the down arrow to open the drop-down list.

3. Select a time increment.

   If you want to select a time increment longer than three days, go to the next step.
4. (Optional) If you want to use a time increment longer than three days, do the following:
   a. Click **Select Date**.
      The Date Picker opens.
   b. Select a date.
      The Date Picker closes and the date that you selected appears in the Time Increment field.

5. Click **Multiple Select** to open the drop-down list of tracked objects.

6. Select the objects to include in the Change History.

7. Enter the search criteria.
   As you type, the system starts to search for objects that match your search criteria.
   A list of objects matching your search criteria appears in the results section.

8. Select an object in the list.
   The change history for the object that you selected appears.
Snapshots

Use snapshots to reliably and repeatedly deploy your software in a continuous delivery cycle. A snapshot is an immutable version of an application in ElectricFlow with specific versions of the artifacts. You can save more than one snapshot of the application during the build, test, deploy, and release phases. You can compare snapshots to optimize and troubleshoot the application.

More about application, deploy, and run:

As you use ElectricFlow, remember that these terms have different meanings within ElectricFlow and outside of ElectricFlow when you deploy your software or application:

<table>
<thead>
<tr>
<th>Term</th>
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<th>Outside of ElectricFlow</th>
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<tr>
<td>Application</td>
<td>The application that you design and run (deploy) to produce your software for continuous delivery across different pipelines.</td>
<td>The software, system or application that you build, test, install, implement, release, and deploy using ElectricFlow. This is the end product of using ElectricFlow.</td>
</tr>
<tr>
<td>Deploy</td>
<td>Running the application that you designed in ElectricFlow. The end product is your software, system, or application. Deploy is a synonym of run in ElectricFlow.</td>
<td>All the processes or actions to develop and run your software in its environment, including building, testing, implementing, installing, configuring, making changes, and releasing.</td>
</tr>
<tr>
<td>Run</td>
<td>Running the application that you designed. The end product is your software, system, or application. <em>Run</em> is a synonym of <em>deploy</em> in ElectricFlow.</td>
<td>All the processes or actions to use software in its environment, including implementing, installing, configuring, debugging, troubleshooting, and releasing.</td>
</tr>
</tbody>
</table>

Adding Snapshots

Follow these steps to add snapshots:

1. Go to the Applications List.
2. Choose an application.
3. Click the **Snapshot** button.

   **Example:**

   ![Snapshot button](image)

4. Select **Snapshot List**.

   The Snapshot List appears.

5. To add a new snapshot, do one of the following:

   If there are no snapshots in the list, click anywhere in the **Add one.** + pane to open the New Snapshot dialog box.

   **Example:**

   ![Snapshot List](image)

   If the list has one or more snapshots, click **Add +**.

   The New Snapshot dialog box appears.

6. Enter a name for the snapshot that must be unique within the application.

7. (Optional) Enter a description of the snapshot.

   **Example:**

   ![New Snapshot dialog](image)

8. Click **Next**.
9. The New/Preview dialog box opens.

Example:

![New/Preview dialog box](image)

10. Toggle between the Component and App Process views to see the components and application processes for the selected application.

Example:

![Component and App Process views](image)
11. In the Component view, select the artifact versions for the snapshot:
   
a. Click the **View** button to see the component processes for a component.
      
      **Example:**

      ![Component view example](image)

      b. Click the down arrow in the **Version** column to open the drop-down list of available artifact versions.
         
         **Example:**

         ![Component view example](image)

   c. Select an artifact version.
12. Click OK.

The "Snapshot <snapshot_name> has been created." message appears.

The Snapshot List is updated and now has the snapshot that you added.

**Example:**

![Snapshot List](image)

---

**Deploying Snapshots**

1. Go to the Applications List.
2. Choose an application.
3. Click the Run process button.

**Example:**

![Run process](image)

4. Select New Run, Last Run, or Schedule.

The dialog box to set the parameters for running an application opens.

In this dialog box, you can deploy a snapshot or compare the application to the selected snapshot.

**Example:**

![Deploy snapshot](image)
5. Select the parameters to run an application.

For more information, go to Deploying or Comparing Snapshots on page 418 and Deploying (Running) Applications on page 173.

**Example:**

![Diagram of ElectricFlow interface](image)

6. To run (deploy) the snapshot:

   1. Click **OK**.
   2. Go to Deploying (Running) Applications on page 173 for more information.

7. To compare the application to the selected snapshots:

   1. Click **Compare** to compare the application to the selected snapshot.
   2. Go to Comparing Snapshots on page 421.

You can compare the application to other snapshots.

**Deploying or Comparing Snapshots**

**How to get here:** From the Home page, go to the Applications List, choose an application, click the Run process button, and select **New Run**.

**Example:**

![Video control](image)

The dialog box to set the parameters for running (deploying) the application opens.

In this dialog box, you can deploy a snapshot or compare the application to a snapshot.
Setting Parameters in the Dialog Box

In the dialog box, the Select a Snapshot option is available (enabled) because the application has one or more snapshots saved.

Example:

![Dialog Box Screenshot]

Select the following options to set the parameters to run the application:

- **Select Process**—Click the pull-down button to select the application to run.
- **Select Environment**—Click the pull-down button to select the environment in which the application will run.
- **Select a Snapshot**—Click the pull-down button to select one or more snapshot.

The Compare option is now available (enabled) because of the following:

- There are one or more snapshots that can be compared to the application in the selected environment.
- The application has been selected.
- The environment has been selected.
- The one or more snapshot has been selected.

Example:

![Dialog Box Screenshot with Compare Option]
Deploying Snapshots

After setting the parameters, click OK to run (deploy) the selected snapshot.

For more information, go to

Comparing Snapshots

After setting the parameters, click OK to compare the selected application to a snapshot.

Managing Snapshots

You can do the following tasks on a Snapshot List:

To open the Snapshot List:

1. Go to the Applications list.
2. Choose an application.
3. Click the Snapshot button.

Example:

4. Select Snapshot List.

The Snapshot List opens.

If no snapshots have been saved, the Snapshot List is empty. Go to Adding Snapshots on page 413 to add a snapshot in the application.

If one or more snapshots have been saved, the Snapshot List shows the saved snapshots.
After you choose a snapshot, click the View details button to view more information about the snapshot.

## Comparing Snapshots

Use one of these methods to compare snapshots:

- Comparing an Application to Snapshots on page 421
- Comparing Snapshots on page 423

### Comparing an Application to Snapshots

1. Go to the Environments List.
2. Select an environment.
   
   **Example:**

   ![Environment List Example](image)

3. Click the Inventory button to open the Environment Inventory.
   
   **Example:**

   ![Environment Inventory Example](image)

4. Choose an application.
   
   **Example:**

   ![Application Inventory Example](image)
5. Click the **Snapshot** button.

   **Example:**

   ![Snapshot Button](image)

6. Select **Compare**.

   **Example:**

   ![Compare Button](image)

The Snapshot Comparison page opens. You can compare the currently deployed application to a snapshot. The currently deployed application is on the left, and the snapshot is on the right. You can choose the snapshot for the comparison.

   **Example:**

   ![Comparison Example](image)
7. Click the pull-down button next to the snapshot name to select a different snapshot.

**Example:**

![Example Image](image1.png)

The Snapshot Comparison page now shows the comparison between the application and the Config_pass snapshot. The components and component processes have changed.

**Example:**

![Example Image](image2.png)

**Comparing Snapshots**

1. Go to the Applications List.
2. Select an application.
3. Click the **Snapshot** icon.
4. Select **Snapshot List**. The Snapshot Comparison page opens.

**Example:**

![Example Image](image3.png)
5. Click the **Compare Snapshots** button to open the Snapshot Comparison page.

**Example:**

![Example:](image1)

6. Click the pull-down button next to the snapshot name in a column to select other snapshots.

**Example:**

![Example:](image2)

The results change when you select different snapshots.

**Example:**

![Example:](image3)
Comparing an Application to Snapshots

How to get here: From the Home page, go to the Environments List, select an environment, and click the Inventory button to open the Environment Inventory.

Example:

This example shows the Store 1.2 application.

The application was run in these environments:

The Environment Inventory for the environment called hc-store dev shows that three artifacts were deployed.

After you click the View button, more information about the artifacts appear.

When you click the Snapshot button, you can either create a new snapshot or compare a snapshot to the currently deployed application.
When one or more snapshots are saved for an application, this menu appears. If the application has no snapshots, you can only create a snapshot.

**Example:**

![Snapshot Comparison Example](image)

In the Snapshot Comparison page, you can compare the currently deployed application to a snapshot. The currently deployed application is on the left, and the snapshot is on the right. You can choose the snapshot for the comparison.

The Snapshot Comparison page has the following information:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Breadcrumb to the Snapshot Comparison page: Environments / Inventory / Compare</td>
</tr>
<tr>
<td>2</td>
<td>Page title: &lt;Application name&gt; on &lt;Environment Name&gt; compared to Snapshots</td>
</tr>
<tr>
<td>3</td>
<td>Number of changes, which is updated automatically depending on the selected snapshot.</td>
</tr>
<tr>
<td>4</td>
<td>Toggle between the Component and App Process views.</td>
</tr>
<tr>
<td>5</td>
<td>When more than one snapshot is saved, the pull-down button is available (enabled). You can select other snapshots to compare.</td>
</tr>
</tbody>
</table>
6  Change Alert icon, which appears next to the object that changed.

7  Click the View button to expand all the rows and view information about the objects in both columns.

8  Click the View button in each object row to view more information about the object in both columns.

When you expand the rows to show details about the objects, the comparison shows that the component processes changed between the currently deployment application and the Release_beta snapshot.

You can compare a different snapshot to the application. Click the pull-down button next to the snapshot name to select a snapshot.

The Snapshot Comparison page now shows the comparison between the application and the Config_pass snapshot. The components and component processes changed.
Comparing Snapshots in the Snapshot List

How to get here: From the Applications List, select an application > click the Snapshot button > select Snapshot List.

Example:

This example shows the Store 1.2 application.

The Snapshot List has four snapshots:

Click the Compare Snapshots button to open the Snapshot Comparison Page.
Example:

In this Snapshot Comparison page, you can compare two snapshots. The newest snapshot is on the left, and the snapshot that was saved before the previous one is on the right.

The Snapshot Comparison page has the following information:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Breadcrumb to this page: Applications / &lt;Application name&gt; / Snapshots compare</td>
</tr>
<tr>
<td>2</td>
<td>Application name</td>
</tr>
<tr>
<td>3</td>
<td>Number of changes, which is updated automatically depending on the selected snapshots.</td>
</tr>
</tbody>
</table>
4

Toggle between the Component, App Process, and Environment views.
Before a snapshot is deployed, only the Component and App Process views are available.

After the snapshot is deployed, Component, App Process, and Environment views are available.

5

When more than two snapshots are saved, the pull-down button is available (enabled). You can select other snapshots to compare.

6

When more than two snapshots are saved, the pull-down button is available (enabled). You can select other snapshots to compare.

7

Change Alert icon, which appears next to the object that changed.

8

Click the View button to expand all the rows and view information about the objects in both columns.

9

Click the View button in each object row to view more information about the object in both columns.

You can compare other snapshots to compare. Click the pull-down button next to the snapshot name in a column to select other snapshots.
The results change when you select different snapshots:

Deleting Snapshots

Do one of these methods to delete snapshots:

- Selecting Snapshots to Delete on page 431
- Deleting All the Snapshots on page 432

Selecting Snapshots to Delete

To delete one or more snapshots:

1. Select the snapshots that you want to delete.
2. Click the Delete button.
   
   Example:

   ![Selecting Snapshots to Delete Example]

   A message appears.

   ![Delete Snapshot Message]

3. Click OK.
Deleting All the Snapshots

1. Click **All**.

All of the snapshots are selected.

2. Click the Delete button.

A message appears.

3. Click **OK**.
ElectricFlow Tutorials

This topic has tutorials to help you use ElectricFlow to deploy your software, system, or application.

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</tr>
</tbody>
</table>

- **Running Applications with Deploy Options** on page 433

Running Applications with Deploy Options

Starting in ElectricFlow 5.2, when running an application, you can do a full or partial deploy and you can run the application on a schedule.

This tutorial describes how to run an application by adding a new artifact and selecting artifact versions to run (partial deploy and smart deploy).

Before You Begin

We recommend designing an application as described in the following list and then running it.

- The application has one application process consisting one or more steps to retrieve an artifact.
- The application has two application tiers, and each tier has two components.
- The application has five artifacts, and each artifact has two versions.
For four of the artifacts, an artifact is retrieved as part of an application or component process.

The fifth artifact is the new artifact that will be added to the application.

- Each component has a component process with one or more steps to retrieve an artifact from a repository.
- The environment has two tiers, and each tier has two resources.
- There are at least two tier maps.

**Tutorial**

To run the application you add a new artifact and select the specific version of an existing artifact:

1. In the application, add the fifth artifact to an application process step that retrieves the artifact.
2. Go to the Applications List, click on the **Run process** button, and select **New Run**.
   The dialog box where you set the parameter to run the application opens.
3. Select the application process and environment, and enable smart deploy.
4. Click **Full run** to open the dialog box with the list of objects in the application.
5. Select the new artifact.
6. For the existing artifact, find it in the list and select the artifact version that you want to use.
7. Click **OK** to return to the dialog box.
8. Click **OK** to run the application.
9. See the results in the Environment Inventory and the Application Inventory.