



Chef Infra Automation Best Practices User Guide

10 Ways to Optimize Your Chef
Infrastructure Automation Investment



CHEF[®]
Progress[®]

The Infrastructure Automation Journey

Infrastructure configuration solutions like Chef Infra have been around for more than 10 years, all but eliminating the need for IT admins to walk from system to system with thumbdrives and crash carts to manually configure on-prem and remote servers. With automation, thousands of systems can be configured in minutes, not days or weeks.

Over the past 10 years a lot has changed within the Chef Infra product portfolio. We've continued to evolve our portfolio making it easier to use, adding new functionality and increasing scalability. The purpose of this guide is to help existing Chef Infra users understand how product line has been evolved and get more out of their Chef investments by taking advantage of new features and usage patterns.

Chef Infra Past and Present: Summary of Key Platform Changes Made in the Last 5 Years

Chef Infra Past		Chef Infra Present
Ruby	Language	Chef Language, Resources, and Helpers
Chef DK, ChefSpec, and Foodcritic	Developer Kit	Chef Workstation, Test Kitchen, and Chef Cookstyle
Roles, Environments, and Audit Cookbook	Content and Compliance	Policyfiles and Chef Client Compliance Phase
Stand Alone Chef Server and Chef Manage	Management	Chef Automate with Integrated Chef Server
Adhoc Testing	Testing	Test Kitchen and Test Driven Development Adoption
Manually Pushing Changes	Deployment	CI/CD Automated Pipelines, GitHub Actions, and Pull Requests

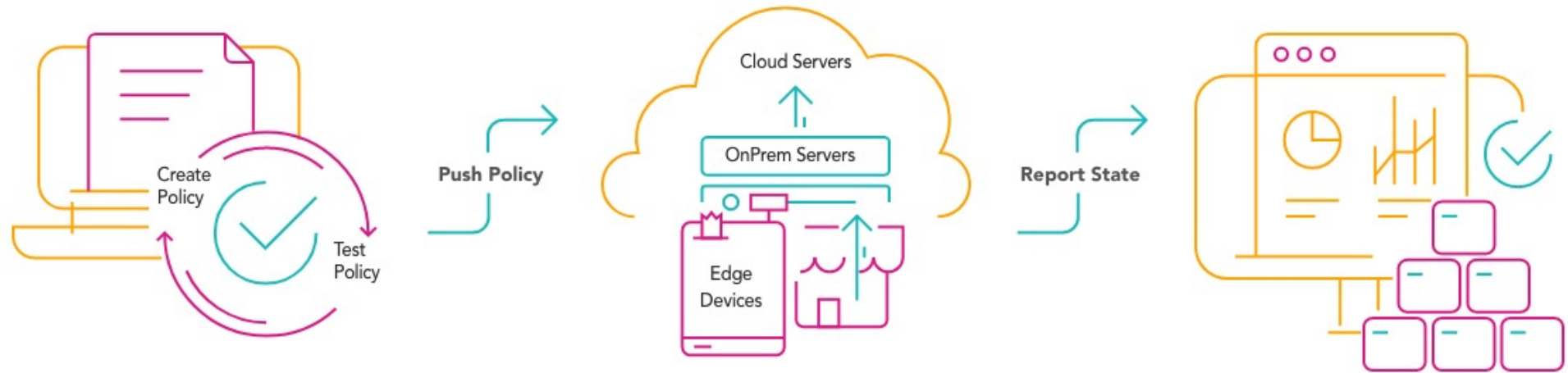


5 Chef Infra Facts

1. A new version of Chef Infra Client has released every April for the past 5 years.
2. Chef Workstation is a full replacement for the ChefDK
3. Chef Infra Server does not follow the same yearly cadence as Chef Infra Client. The Latest release is 14.x and both 14.x and 13.x work with all recent Chef Infra Client releases
4. Chef Cookstyle has fully supplanted Foodcritic and now includes 224 "cops"
5. Chef Automate provides dashboards and actionable data for Chef Infra

Chef Infra Policy-Based Infrastructure Automation Architecture

Using Chef Infra to automate configuration management allows DevOps teams to define policies that are repeatable, consistent and reusable. The result is increased business agility and security because all systems and resources are continuously and automatically evaluated, corrected, and modified.



Chef Workstation

Reduce risks by iterating on policy changes before pushing them to production. Workstation includes:

- **Chef Tools:** Chef Infra Client, Chef InSpec, Chef Habitat, Chef Cookstyle, and knife
- **Chef Language:** Pre-built resources for managing systems and helpers that make authoring and distributing cookbooks easy

Chef Infra Client and Server

Enforce policy by converging systems to the state declared by Chef resources. Chef Infra Client key capabilities include:

- Planned, unstructured and policy-based updates
- Dynamic behavior support
- Ephemeral resource management
- Data collection

Chef Automate

View and validate intended and actual state across all systems. Chef Automate key capabilities include:

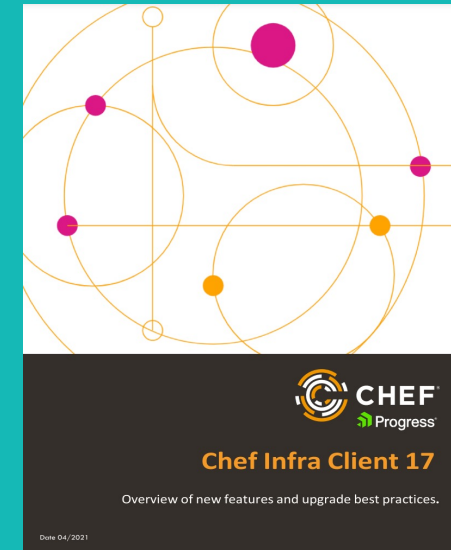
- Real-time interactive dashboards
- Role-based access controls
- Third-party integrations
- Data APIs
- Chef Infra Server management

Chef Infra Client 17: Policy-Based Configuration Automation

Chef continued to improve the products we build and expand its automation coverage with Chef Infra, and lead in the DevOps space. With the launch of **Chef Infra Client 17**, Chef has made automation easier for a wider range of users and use cases. Along with tools provided with Chef Workstation, Chef Infra Client 17 better enables organizations to adopt Test Driven Development (TDD) practices that make infrastructure management reliable and secure.

Automation Improvements with Chef Infra Client 17:

- **Streamlined Developer Experiences:** The Chef Infra Language offers users built-in resources and helpers that make codifying infrastructure easy and shareable across teams. Resources can install and manage packages and services, define security policies, configure firewalls, and make other system configurations across cloud providers, system architectures, and OS releases. Enhancements to Test Kitchen allow users to better preview configurations on the wide range of platforms and public clouds, and Chef InSpec allows users to confirm configurations before deploying them to production environments.
- **Increased Platform Coverage and Support:** Chef Infra 17 offers expanded coverage and support for Arm in the cloud, macOS Big Sur, the Apple M1 architecture, Linux, Windows and PowerShell Core.
- **Cookstyle Enhancements:** Chef Workstation includes Cookstyle, a code-analysis tool built on RuboCop, which replaced Foodcritic in September 2019. It helps users fix deprecations, upgrade Chef Infra Client releases, and modernize their codebase. The latest release includes 100+ new rules (called cops) that can automatically detect and correct most coding style errors and bugs. Running Cookstyle against Chef configuration files helps ensure accuracy and consistency across teams.



Chef Infra Client 17 Now Available!

Chef Infra Client 17 improves platform coverage, cloud support and the developer experience with enhanced tools and capabilities.

[>>> Download the Chef Infra Client 17 Product Guide Today!](#)

#1 Use Cookstyle to Upgrade Your Cookbooks for Chef Infra 17

The tools you use to manage your infrastructure, just like your infrastructure, are in constant flux. Managing updates to your automation tools should be just as easy as managing updates to your infrastructure. Historically, this was not always the case with Chef Infra Client, which introduced code changes that required manual work to update cookbooks and other resources to avoid potential bugs. Today, Cookstyle dramatically simplifies and automates the upgrade process.

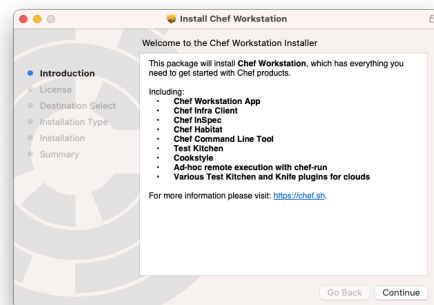
With Chef Cookstyle, you no longer need to download or use multiple versions of the Chef Development Kit (now Workstation) for version migrations, run Foodcritic against each cookbook and then review the output for changes. With Cookstyle, you simply set a target version in your cookbook's `.rubocop.yml` and get rolling! We've added even more "cops" to make this process easier to customize and manage.

Benefits:

- **Reduce Defects:** Find and eliminate potential bugs
- **Streamline Upgrades:** Minimize time and effort required for upgrades
- **Modernize Codebase:** Take advantage of new features sooner

Resources:

- [OnDemand Webinar: Prepare for New Chef Infra Client Releases with Cookstyle](#)
- [Documentation: Chef Cookstyle](#)
- [Chef Infra Extension for Visual Studio Code](#)
- [chef_client_updater cookbook repo](#)



Chef Workstation always includes the latest version of Cookstyle



More About Chef Cookstyle

Cookstyle is a code analysis tool built upon [RuboCop](#) that replaced Foodcritic in September 2019 and ships as part of Chef Workstation.

Today, Chef Cookstyle includes more than 220 Chef Infra specific rules (called cops) that catch common cookbook coding mistakes, clean up portions of code that are no longer necessary, and detect deprecations that prevent cookbooks from running on the latest releases of Chef Infra Client.

Running Cookstyle on your infrastructure code ensures everyone on your team follows a common coding style, avoids potential bugs, and utilizes the latest Chef Infra Client functionality.

#2 Configure Chef with Chef

Over the years, users have changed how they configure and manage the Chef Infra Client. Many used the [chef-client cookbook](#) or wrote their own cookbooks to manage the client.rb configuration file, run the chef-client service, or install their own trusted certificates. Much of this manual work is eliminated with functionality now included in Chef Infra Client 17.

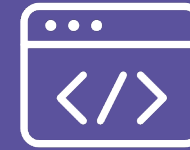
The built-in [chef_client_config](#) resource creates a [client.rb](#) file in the Chef Infra Client configuration directory on each node and includes your specified settings. The [chef_client_launchd](#) resource for macOS, the [chef_client_scheduled_task](#) resource for Windows, and the [chef_client_systemd_timer](#) or [chef_client_cron](#) resources for Linux and UNIX all schedule Chef Infra Client runs on their respective platforms. The [chef_client_trusted_certificate](#) resource adds certificates to Chef Infra Client's trusted certificate directory, allowing the Chef Infra Client to communicate with internal encrypted resources without errors.

Benefits:

- **Simplify Management:** Manage the Chef Infra Client with a single recipe specific to your organization
- **Reduce Maintenance:** No longer necessary to update and track external cookbooks
- **Increase ROI:** Easily update to the latest version of Chef Infra Client and take advantage of new features

Resources:

- config.rb - https://docs.chef.io/workstation/config_rb
- Cookbook resources - <https://docs.chef.io/resource/>



Key Commands:

Chef Infra Client 17 includes resources that eliminate the need to manually configure some common system tasks, settings and resources:

- chef_client_config
- chef_client_launchd
- chef_client_cron
- chef_client_scheduled_task
- chef_client_launchd
- chef_client_systemd_timer
- chef_client_trusted_certificate

Learn more about Chef Infra Resources [here](#).

#3 Adopt Immutable Policy

Policyfiles are the best way to handle dependencies and change management across your Chef Infra managed infrastructure. They combine the very best parts of Roles, Environments, and Berkshelf into a single workflow. Because Chef Infra Policyfiles are immutable and cannot be changed once bundled, the Chef Infra Client no longer recalculates dependencies at the start of every run, making them faster and more efficient.

With Policyfiles, Chef Infra users no longer need to take precautions to prevent configurations from changing out from under them. Policyfiles lock in specific cookbook versions and runlists. They cannot be changed without recreating the associated lock file. Policyfiles allow you to perform controlled promotions of changes from dev to staging to production with confidence. No more pinned cookbook versions in environments or roles that cannot be versioned.

Benefits:

- **Create Immutable Artifacts:** Ensure cookbooks running in production are the same versions that were tested in development
- **Single Workflow:** Streamline the Roles and Environments patterns by placing dependency management into a single workflow
- **Improve Manageability:** Solve the Roles and Environments versioning issues

Resources:

- [Blog: Policyfiles: A Chef Best Practice](#)
- [Learn Chef: Manage Your Fleet with Chef Infra](#)
- [Documentation: About Policyfile](#)
- [Documentation: About Berkshelf](#)
- [Community: Policyfiles, Hedge-ops.com](#)



Top Policyfiles Adoption Drivers

Policyfiles are particularly useful if you encounter one of the scenarios:

- Ongoing trouble with cookbook dependency management.
- Want a faster way to onboard new Chef Infra users and make it easier for them to work with Chef Infra.
- Restrictions on change-control in your organization are very high.
- Working in air-gapped (i.e. network disconnected) environments where the process of packaging a policy and its dependent cookbooks into a single archive file works well.

#4 Get the Latest and Greatest Chef Community Content

Chef's community is one of its key strengths, and we really value the relationships and interactions we have with our community members. Progress believes in the importance of this community and sees the contributor model that Chef built as an ideal model for any open-source project. It provides value to the entire DevOps and DevSecOps ecosystem, and Progress is happy to continue to support that.



The [Sous Chefs](#) are a community of Chef Infra cookbook developers working together to maintain important cookbooks. They also adopt cookbooks that need new homes when a maintainer has moved on to focus on other work.

Today, the Sous Chefs community manages more than 100 cookbooks used by companies all over to the world.

Benefits:

- **Constant Support:** Help from people using Chef products at scale
- **Access to Content:** Access to community-provided and -supported resources
- **Ongoing Collaboration:** Weekly updates from internal development teams

Resources:

- [Blog: Managing Cookbooks at Scale](#)
- [GitHub: Sous Chefs maintained cookbooks](#)
- [ChefConf Online 2020 Recorded Presentations](#)



Get Involved with the Chef Community!

Chef Community Discourse

<https://discourse.chef.io>

Chef Community Slack

<https://community-slack.chef.io/>

Weekly Community Meetings

Thursdays at 9:00AM PT |

#community-meetings in Slack

Chef User Groups and Meet-Ups

<https://events.chef.io/>

#5 Create Custom Resources

Chef Infra Client includes more than 150 built-in resources to manage things like files, packages, templates, and services. It also enables users like website managers to build custom resources by combining built-in resources into reusable site features, directories, templates, files and port settings. Custom resources simplify Chef Infra recipes by removing complexities from the `/recipes/default.rb` file and adding them to an easier-to-manage `/resources/CustomResourcesName` file.

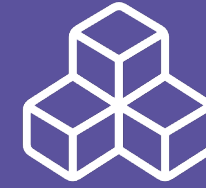
Custom Resources allow you to define in one place complete configurations, such as “This is how we setup an apache vhost”. If you need to change your vhosts later, you just update one shared custom resource, rather than having to go through multiple files to make updates. This object-oriented approach is easier to manage and results in custom resources that work the same way wherever you use them.

Benefits:

- **Reuseability:** Create a single resource that can be used on different target platforms
- **Simplicity:** A Custom Resource is much simpler to create when compared with the LWRP and HWRP.
- **Ease of Use:** Automation experts can create custom resources that others across the organization can then easily consume

Resources:

- [Webinar: Custom Resources the Building Blocks of your Cookbooks](#)
- [Learn Chef: Extending Chef Infra: Custom Resources](#)
- [Documents: Custom Resources](#)
- [Documents: Custom Resource DSL](#)



Custom Resources Basics

Custom resources enable users to add their own resources as an extension of Chef Infra client. Commonly used resources can be further streamlined by packaging them into custom resources as resource-only cookbooks. Custom resources are created by making a Ruby file in the cookbook's resource file. Cookbooks can have multiple resources.

Custom resource contents are composed of three basic parts:

- Declarations of the properties used in the Custom Resource
- Loading of the current value of the properties, if they already exist
- Definitions of the actions that the Custom Resource can take

#6 Use Test Kitchen with Docker

Test Kitchen allows you to spin up containers or VMs and test your cookbooks all in a single step. You can define the systems – Ubuntu, CentOS, RHEL, etc.– and have your Chef configurations and cookbooks applied as they launch. It's a great way to test your configurations on multiple platforms all at once and in real-world environments.

Kitchen Dokken (not to be confused with less capable kitchen-docker) allows users to deploy more complex configurations quickly using Docker alongside other provisioning tools, like Vagrant.

Kitchen Dokken starts with familiar Docker OS images, but adds back in capabilities that give the containers a true Linux test environment. Instead of requiring add-ons, Test Kitchen installs the Chef Infra Client agent and deploys your cookbooks, policies and other Chef Infra configurations quickly and easily, making Kitchen Dokken ideal for developers. Finished and tested Chef Infra configurations can then be confidently added to your infrastructure and application-delivery workflows.

Benefits:

- **Rapid, lightweight provisioning:** Use Docker to quickly test and deploy configurations in real-world environments
- **Built-in Networking Capabilities:** Containers can readily communicate and exchange data
- **Test Driven Development:** Include configurations and compliance tests in one step to ensure reliable outcomes before deploying to production

Resources:

- [Blog and OnDemand Webinar: Testing Chef Infra Cookbooks Fast with Docker](#)
- [GitHub Kitchen-Dokken: Test Kitchen Driver and Transport for Docker](#)
- [Documentation: Test Kitchen](#)



Test Kitchen Overview

[Test Kitchen](#) is an independent open-source project sponsored by Chef to provide real-world test environments to execute infrastructure code on one or more platforms in isolation.

Test Kitchen is Chef's integration testing tool of choice for cookbooks. It's included as part of Chef Workstation and used by all Chef-managed community cookbooks.

Test Kitchen uses a driver plugin architecture and can be used to test across multiple platforms, not just Docker:

- Cloud platforms including Amazon EC2, Google Compute Engine, and Microsoft Azure.
- Local hypervisors, such as VMware, Hyper-V, or VirtualBox.

#7 Get to Know GitHub Actions

GitHub Actions makes it easy to automate all your software workflows. With GitHub Actions, merging a pull request, pushing a commit, creating a new issue, and other tasks can run as events, signaling other processes to occur. GitHub Actions allow you to easily integrate Chef Infra runs into existing CI/CD processes and implement Test Driven Development (TDD). This approach to infrastructure configuration ensures all changes are automatically run through Test Kitchen before being promoted to the next release state.



GitHub Actions

Benefits:

- **Automate Deployments:** Integrate with existing CI/CD workflows
- **Adopt Test Driven Development Approach:** Each step is verified by design, not by chance
- **Secure:** Avoid man-in-the-middle and other untrusted code from making its way into your workflows

Resources:

- [Git Repository Test Kitchen Workflow: actionshub-test-kitchen Github Action](#)
- [Git Repository Chef Sous-Chefs: Running Test Kitchen tests on Windows with Github Actions](#)
- [Webinar: Automated Cookbook Testing with GitHub Actions](#)



Meet the Sous-Chef!



Jason Field, ECS

- Open Source Advocate
- Creator of @actionshub
- @sous-chefs Board Member

#8 Improve Visibility Across all Your Chef Infra Runs with Real-Time Dashboards

Chef Automate provides enterprise management and observability capabilities, and it's included with every Chef subscription. Chef Automate offers visual UIs, real-time interactive dashboards, Identity and Access Management (IAM), third-party integrations, data APIs, and much more. Chef Automate enables Infrastructure, DevOps, Security, Cloud and Release teams to easily collaborate and get work done, all while maintaining an auditable history of changes to system environments.

Chef Automate also can be used to install Chef Infra Server, either for a single-host installation that contains both Chef Infra Server and Chef Automate, or for a standalone Chef Infra Server instance. Chef Automate provides a graphical management console for the Chef Infra Server.

Benefits:

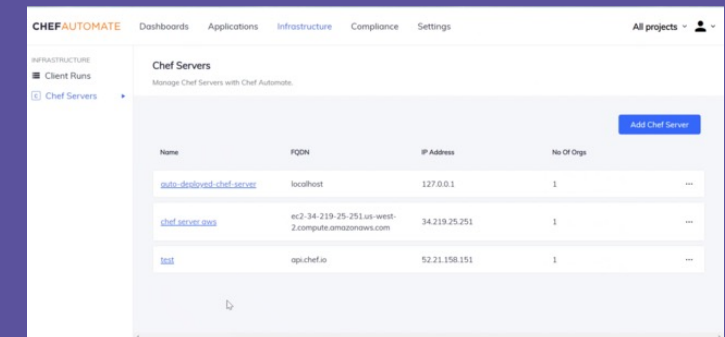
- **Real-Time Data Across Environments:** Aggregated, filterable dashboards collect configuration details for every datacenter, cloud provider and environment you manage
- **Faster Remediation:** Automate the end-to-end process of identifying and remediating infrastructure drift
- **Continuous Compliance:** Enable compliance and audit teams with self-service dashboards and reports

Resources:

- [Documents: Chef Infra Server dashboards in Chef Automate](#)
- [Blog: New Chef Infra Server Automate Functionality and EOL Updates for Chef Manage and Backend](#)
- [Learn Chef: Secure Your Infrastructure with Chef Automate](#)
- [Documents: Install Chef Infra Server with Automate](#)



New! Chef Automate Infrastructure State Management Dashboard

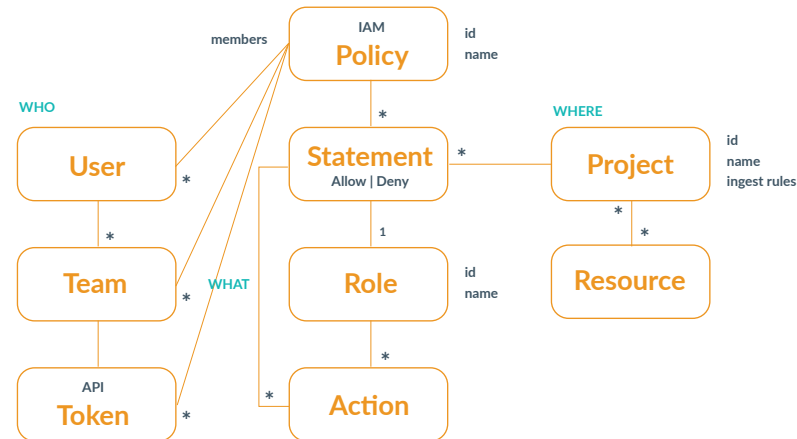


The **Chef Automate Infrastructure State Management Dashboard** provides users views of the desired state of their infrastructure, speeding their ability to identify the cause of any configuration drift and take action.

#9 Simplify User Management with Identity and Access Management (IAM)

Operating complex services and environments is a collaborative effort requiring a consistent view of intended and actual system states across teams. Chef Automate administrators can create customizations that provide them with resource-specific authorization for users or teams, either created locally or imported from existing LDAP or Active Directory. Project data within Automate is then restricted to authorized users and teams.

Chef Automate Policy Structure



Benefits:

- **Secured Access:** Enhanced multi-statement policies and role-based access control with a set of built-in roles to simplify typical security configurations.
- **Project Level Control:** Project-scoped access control for up to 30 projects that limit permissions to resources defined in the project
- **Enterprise Manageability:** Easily onboard and manage 100s of users

Resources:

- [Documents: Chef Automate LDAP Authentication via Existing Identity Management Systems](#)
- [Documents: Chef Automate Identity and Access Management \(IAM\) Overview](#)
- [Blog: Chef Automate Product Announcement: Identity and Access Management Release](#)



Enterprise Control and Coordination

Data within Chef Automate can be restricted to the projects a user or team has access to. Notifications can be displayed on a per-node, per-failure basis, or configured for alerts to chat, webhook endpoints, or ServiceNow.

The screenshot shows the "Create Project" form in Chef Automate. The form includes the following fields and options:

- Name ***: A text input field containing "StorageAssets". Below the field, a note states: "Don't worry, project names can be changed later."
- ID:** storageassets (with a link to "Edit ID")
- Also create owner, editor, and viewer policies for this project.
- Create Project** (button) and **Cancel** (button)

#10 Streamline Compliance Checks with Chef Infra Compliance Phase

Chef Infra Client Compliance Phase replaces the existing audit cookbook, enabling compliance and auditing reporting using our Chef InSpec engine as part of any Chef Infra Client run without the need for the audit cookbook. The new compliance phase is fully backwards compatible with the audit cookbook.

The Compliance Phase also features a new compliance reporter: `cli`. This report mimics the Chef InSpec command line output giving you a visual indication of your system's compliance status. *Thanks for this new reporter Chef Community Contributor [@aknarts](#).*

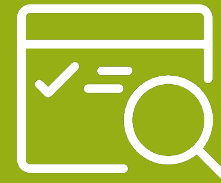
Existing audit cookbook users can migrate to the new Compliance Phase by removing the audit cookbook from their run_list and setting the ``node[\"audit\"]['compliance_phase'] = true``

Benefits:

- **Zero Dependencies:** Compliance out of the box without the need for solving or managing cookbook dependencies
- **Simplified Upgrade:** Compliance code upgrades with your Chef Infra Client releases so you always have a working solution
- **Reduced Server Dependency:** No cookbook code to fetch from the server. Perfect for high latency or air-gapped environments

Resources:

- [Documents: Chef Infra Compliance Phase](#)
- [Blog: Serve-up Continuous Compliance with Chef Infra Compliance Phase](#)
- [Webinar: Configure Chef Infra & Compliance Using Built-In Functionality](#)



Chef Infra and Chef InSpec Better Together

Chef Infra Compliance Phase simplifies the workflow needed to run Chef InSpec compliance audits, view results and do analysis. It extends our policy-based approach to configuration enabling a single agent that can handle the end-to-end workflow from state enforcement to, data aggregation to validation.

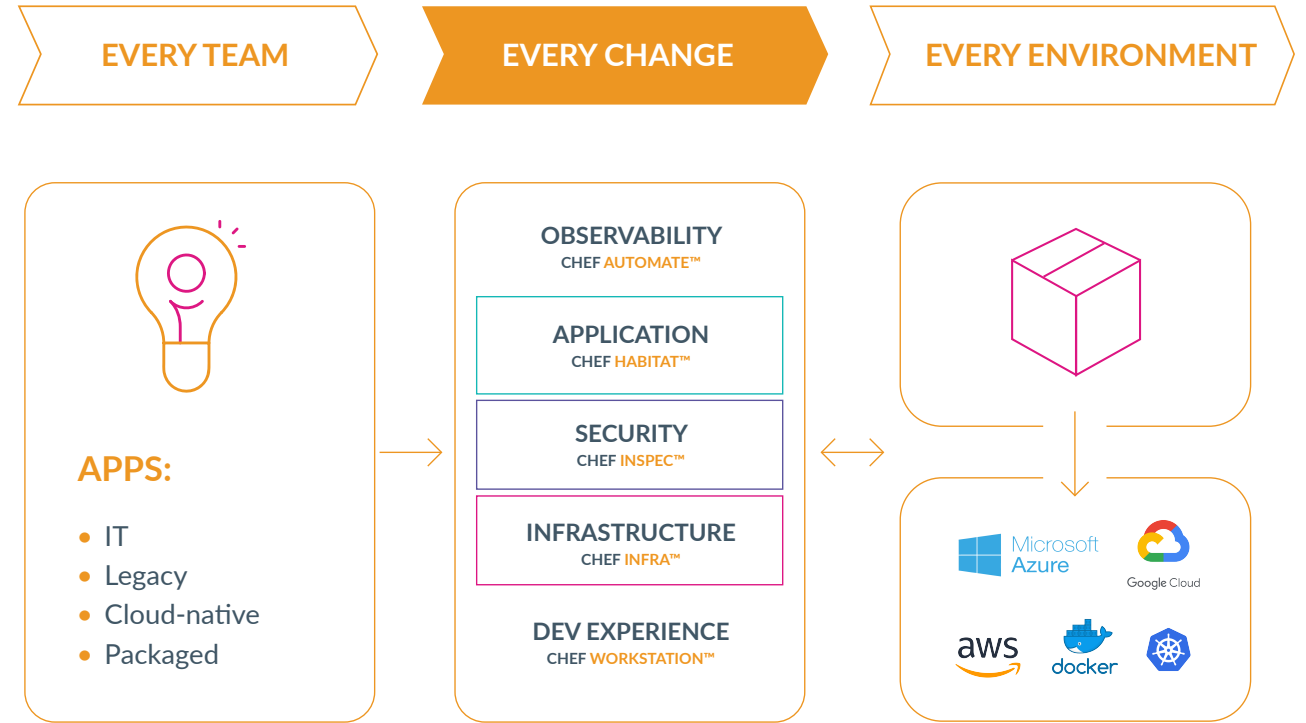
Go Beyond Infrastructure Management Automation

[Chef Enterprise Automation Stack \(EAS\)](#) provides teams implementing DevSecOps with a common approach for automating application delivery, infrastructure configuration and compliance auditing.

Chef InSpec provides an additional level of system state enforcement. It provides a language that describes system state expectations in a way that can be directly mapped to policies defined for Chef Infra, providing insight into how to remediate any misconfigurations uncovered in audits within the same toolkit.

Chef Habitat is the evolution of Chef's software configuration capabilities and redefines the way applications are delivered. While traditional code-based configuration solutions are good for managing infrastructure-as-code they are not well suited for managing service architected applications with many dependencies that are updated frequently and require quick actions like stop/start/restart.

An example of a use case Chef EAS is especially well suited for includes managing complex applications on Windows. Operating system level configuration concerns such as domains, firewalls and others can be managed with Chef Infra, while Chef Habitat handles the build and deployment of your applications itself. Together with Chef InSpec you can guarantee that your application has been delivered safely and securely with all the policy you've defined for it enforced.



"We not only wanted to accelerate our adoption of agile delivery practices but create an organization of developers that we taught to do operations and collaborate via code. Chef's code based approach to automation enabled us to do this and now sits as the foundation that everything else is built upon including our core applications, services, containers, etc."









Corey Johnston
Manager of Cloud Engineering, Edgenuity

Stay on Top of the Latest and Greatest from Chef

CHEF QUESTIONS

Sign Up Log In 🔍 ☰

Chef Release Announcements ▾ Latest Top

Topic		Replies	Views	Activity
<p>🚩 About the Chef Release Announcements category</p> <p>This category is used to announce releases of Chef software and other projects related to Chef. Only Chef Staff and project maintainers can post in this category. All discussion related to the announcements should be pos... read more</p>		0	1.3k	Feb '16
Chef InSpec 4.37.0 Released!		0	4	15m
Chef Workstation 21.5.420 Released!		0	38	20h
Chef InSpec 4.36.4 Released!		0	53	7d
Chef Infra Client 17.0 Released!		0	94	7d
Automate 2 version 20210420090302 Released!		0	65	9d

Subscribe to the **Chef Releases** Discourse Channel: <https://discourse.chef.io/c/chef-release/9>



ABOUT CHEF AND PROGRESS

Progress (NASDAQ: PRGS) provides the best products to develop, deploy and manage high-impact business applications. Acquired in October 2020, Chef extends Progress offerings in DevOps and DevSecOps, with market-leading, modern infrastructure, compliance, and application automation. With Progress, you can accelerate the creation and delivery of strategic business applications, automate the process by which you configure, deploy and scale those apps, and make your critical data and content more accessible and secure— leading to competitive differentiation and business success. Over 1,700 independent software vendors, 100,000+ enterprise customers, and a three-million-strong developer community rely on Progress to power their applications. Learn about Progress at www.progress.com or +1-800-477-6473.

<http://www.chef.io>

