

Driving Application Delivery To The Edge: The Story Of Tesco

EBOOK

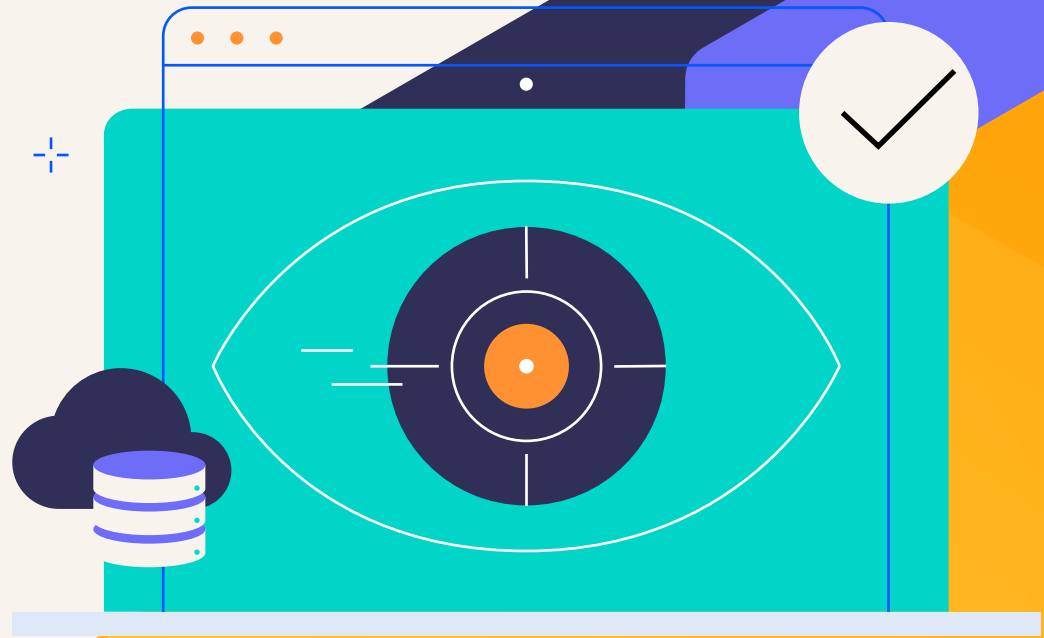


Table of Contents

What is Edge Computing? / 3

Challenges with Edge Computing / 4

Chef in Edge Computing / 5

Edge Computing with Chef at Tesco / 6

Company overview and IT landscape / 6

Requirement / 7

Objectives / 7

Key Challenges / 7

How Chef Helped / 8

Conclusion / 9

Chef solutions driving change / 10



What is Edge Computing?

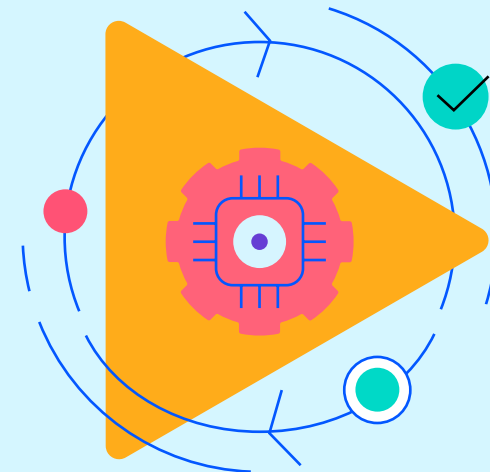
Edge computing brings computational capabilities to the devices near the user; in other words, it enables processing capabilities in edge devices located near the place where data is being generated. Enabled by cloud data centers, edge computing is typically different from the traditional approach of centralized data centers. The cloud brings with it the ability to provide actionable and valuable insights as well as control over business operations, as opposed to the traditional approach of centralized data centers that are not suited to transferring or processing growing amounts of data in real-time.

Latency, bandwidth issues, and poor network connectivity are commonplace with traditional data centers. As a result, we are witnessing an increasing trend of moving towards edge computing architectures. Edge brings with it the promise of faster and more reliable data exchange and processing, even when the devices such as kiosks in streets or POS (point of sale) devices in retail stores are placed far away from the data center.

As a result, edge computing is reshaping how organizations treat IT. By bringing computation, storage, and security capabilities to edge devices, human interaction is only required to review and analyze the insights that are collected and sent back to the data center.

By 2024, due to an explosion of edge data, 65% of the G2000 will embed edge-first data stewardship, security, and network practices into data protection plans to integrate edge data into relevant processes.

[Source: IDC FutureScape: Top 10 Predictions for the Future of Digital Infrastructure →](#)



Challenges with Edge Computing

Device management

Management of edge devices is a challenging task owing to their distance from data centers. To ensure that updates are installed correctly on every device, they need to be:

- Connected to the network or each other
- Cannot break in functionality
- Should not require visits by technicians to fix issues

With the enormous number of edge devices spread across numerous locations, addressing these challenges can become time-consuming and cumbersome, especially when you cannot mimic production environments or test updates and configurations before launch. In addition, managing edge devices at scale require tools and processes that automate, test, verify, and fix issues disrupting seamless service delivery.

Security and validation

Security is a fundamental requirement in IT, and edge devices are no exception. But when devices are present in large numbers across numerous satellite locations, guaranteeing security and compliance across the vast expanse can pose a significant problem.

Replicating an actual setup of a retail store or a factory floor to test and manage devices is not a viable option. Similarly, production failures cannot be fixed in actual setups by visiting hundreds and thousands of locations in person and updating security and compliance postures in those environments.

This makes implementing an application delivery and compliance management automation tool at the edge a necessity. Tools like Chef allow organizations to test, validate, package, and securely roll out applications/changes across numerous edge computing devices while having deep visibility into the state of these devices.

Scale

- 1000s of devices
- Manual and disparate delivery processes
- Lack of delivery standards
- Poor tooling

Management

- Snowflakes/ multiple configurations
- Hard to mimic production environments and perform tests
- Bare metal installations
- Functional updates cause compatibility problems
- High % of time spent fixing production failures

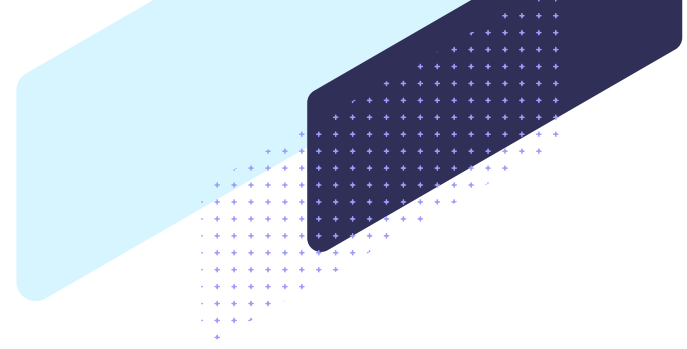
Validation

- Compliance and security updates
- Builds fail for unknown reasons
- No way to view and validate deployment success in real time

Chef in Edge Computing

Chef's Policy-as-Code approach provides scalable, testable, and consistent artifacts that can automate infrastructure configuration, compliance, and application delivery quickly, securely, and consistently across the entire heterogeneous IT fleet.

Most of Chef's code is open source with contributions from its strong, active, and growing community. In addition, Chef provides over 1000 content templates for users to apply to their IT ecosystem for infrastructure and security automation.



DevOps practices like the 'as code' model is required for high performance at the edge.

01

Adopt an "As Code" Approach

Chef enables users to create standard, modular application packages in the form of a single artifact that is deployed across multiple environments securely and with a consistent approach across all applications. Furthermore, these artifacts are thoroughly tested for security and compliance based on CIS (Center for Internet Security) benchmarks using the test kitchen feature within Chef.

02

Leverage Open-Source Community Content

03

Standardize Application Packaging and Testing Practices

Chef offers 'edge-friendly' automation with support for air-gapped devices. The Policy-as-Code approach helps audit devices for vulnerabilities and automatically remediate drifts based on pre-defined standardized policies. Also, Chef allows changes to be rolled forward or backward depending on need and impact.

04

Implement an "Edge-Friendly" Deployment Automation Solution

05

Validate Delivery Status in "Near" Real-Time

Complete visibility into the state of configurations and compliance postures on the edge devices allows validation of deployments and the health of devices across the entire distributed resource fleet. In addition, this enables easy tracking of non-compliant devices and remediation status.

Edge Computing with Chef at Tesco



Company overview and IT landscape:

Tesco PLC is the world's third-largest grocery and general merchandise retailer measured by gross revenues^{[6][7]} and the ninth-largest in the world measured by revenues. The Tesco technology team is responsible for all Tesco systems—from the corporate data center to the checkout lines in 2,700+ stores worldwide. Their IT team needed an automation solution for in-store server migration and automated validations every day across all stores.

Tesco Technology

1 BILLION

store/product order calculations per day

272.3 MILLION

miles of lorry journeys scheduled each year

112 MILLION

square feet of space planned by our systems

26,000

PCs for head office users

52,500

checkouts, including

16,000

self-service checkouts

50,000

on-prem VMs

22,000

PCs for our stores

9,000

Cloud VMs

Requirement:

Tesco needed to migrate from existing physical servers and applications to a new service-orientated architecture that would run on an in-store virtual edge platform. This move would allow the updating or redefinition of server configuration, thus eliminating many existing support and remediation challenges.

Objectives:

- Improve visibility – Provide insight into compliance levels and status reporting
- Streamline system management – Implement a centralized solution to increase coverage across all heterogenous systems and prevent multiple people from working on numerous systems individually
- Ensure a smooth transition across platforms
- Have predictable (testable) outcomes at scale
- Use repeatable, reliable, and secure automation across the entire IT estate

Key Challenges:

- **Securely upgrade store-based systems and processes**—Tesco required an automated solution to upgrade applications in a secure and compliant way.
- **Maintain existing operations**—New deployments had to be secure and reliable without breaking existing operations and processes.
- **Continue to support legacy applications** —A holistic management approach was needed.
- **Time and resource constraints** —The lead time for server builds, disaster recovery, and application updates had to be reduced.



How Chef Helped:

Chef provided the foundation for a new solution providing repeatable automation that helped Tesco advance their CI/CD efforts and deliver predictable outcomes at scale. The application and infrastructure teams were able to separate their responsibilities and developed a set of flexible automation templates (Chef cookbooks) that were easy to customize and version.

Adopting Chef has enabled the Tesco Ops team to provide more flexible server configurations without increasing the overhead and delivering application updates faster:

- **Resilience** – Time to recover has reduced by 94%, and a dramatic decrease in build times have been observed
- **Compliance** – 100% automated validation of 2900+ stores daily
- **Customer Impact** – Improved control of the ecosystem change velocity
- **Scale** —Helped control the scale of configurations across many different platforms
- **Reduced Costs** —Significantly reduced operational and maintenance costs



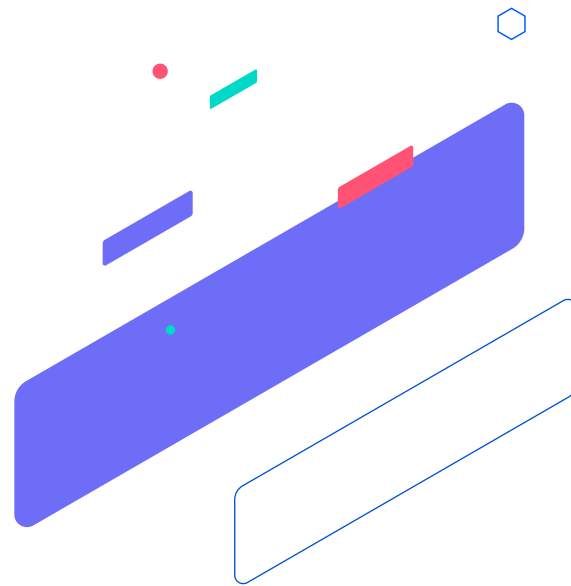
“One of the strongest reasons for us to choose Chef was its agnostic nature. As a result, we can easily cook up solutions for our developers to work on multiple environments.

Nathan Luxford, Head of Cloud Platforms, Tesco



Conclusion:

Chef's Enterprise Automation Stack has a proven legacy of helping organizations achieve secure and consistent edge computing with ease. Given that the primary challenges associated with edge computing are device management and security, EAS bundles solutions that enable infrastructure management automation, application delivery, and compliance automation to ensure there are no unaddressed challenges. Built to solve a myriad of use cases, Chef's EAS solution enables organizations to deliver applications and infrastructure continuously that are inherently secure by design.



Infrastructure Management

- Configuration Management
- Infrastructure as Code
- Drift Management



Compliance and Remediation

- CIS Certified Audit and Remediation Content
- Automated Remediation
- Compliance Reporting



App Delivery

- Runbook Automation
- Application Packaging
- Application Release and Orchestration

Chef solutions driving change:

Chef tools that are driving transformative change in the DevOps automation sphere include:

- [Chef EAS](#): Our full suite of enterprise infrastructure, application, and DevSecOps automation technologies for delivering change quickly, repeatedly, and securely.
- [Chef Infra](#): Ensures configurations are applied consistently in every environment with infrastructure management automation.
- [Chef Compliance](#): Makes it easy to maintain and enforce compliance across the enterprise.
- [Chef App Delivery](#): Enables delivery of successful application outcomes consistently at scale.
- [Chef Desktop](#): Allows IT teams to automate the deployment, management, and ongoing compliance of IT resources.
- [Chef Cloud Security](#): Offers Cloud security management and governance capabilities for hybrid and multi-cloud environments.



Learn More About Progress Chef: www.chef.io

About Progress

Dedicated to propelling business forward in a technology-driven world, [Progress](#) (NASDAQ: PRGS) helps businesses drive faster cycles of innovation, fuel momentum and accelerate their path to success. As the trusted provider of the best products to develop, deploy and manage high-impact applications, Progress enables customers to develop the applications and experiences they need, deploy where and how they want and manage it all safely and securely. Hundreds of thousands of enterprises, including 1,700 software companies and 3.5 million developers, depend on Progress to achieve their goals—with confidence. Learn more at www.progress.com.

© 2023 Progress Software Corporation and/or its subsidiaries or affiliates. All rights reserved. Rev 2023/04 RITM0164384

- facebook.com/getchefdotcom
- twitter.com/chef
- youtube.com/getchef
- linkedin.com/company/chef-software
- learn.chef.io
- github.com/chef
- twitch.tv/chefsoftware