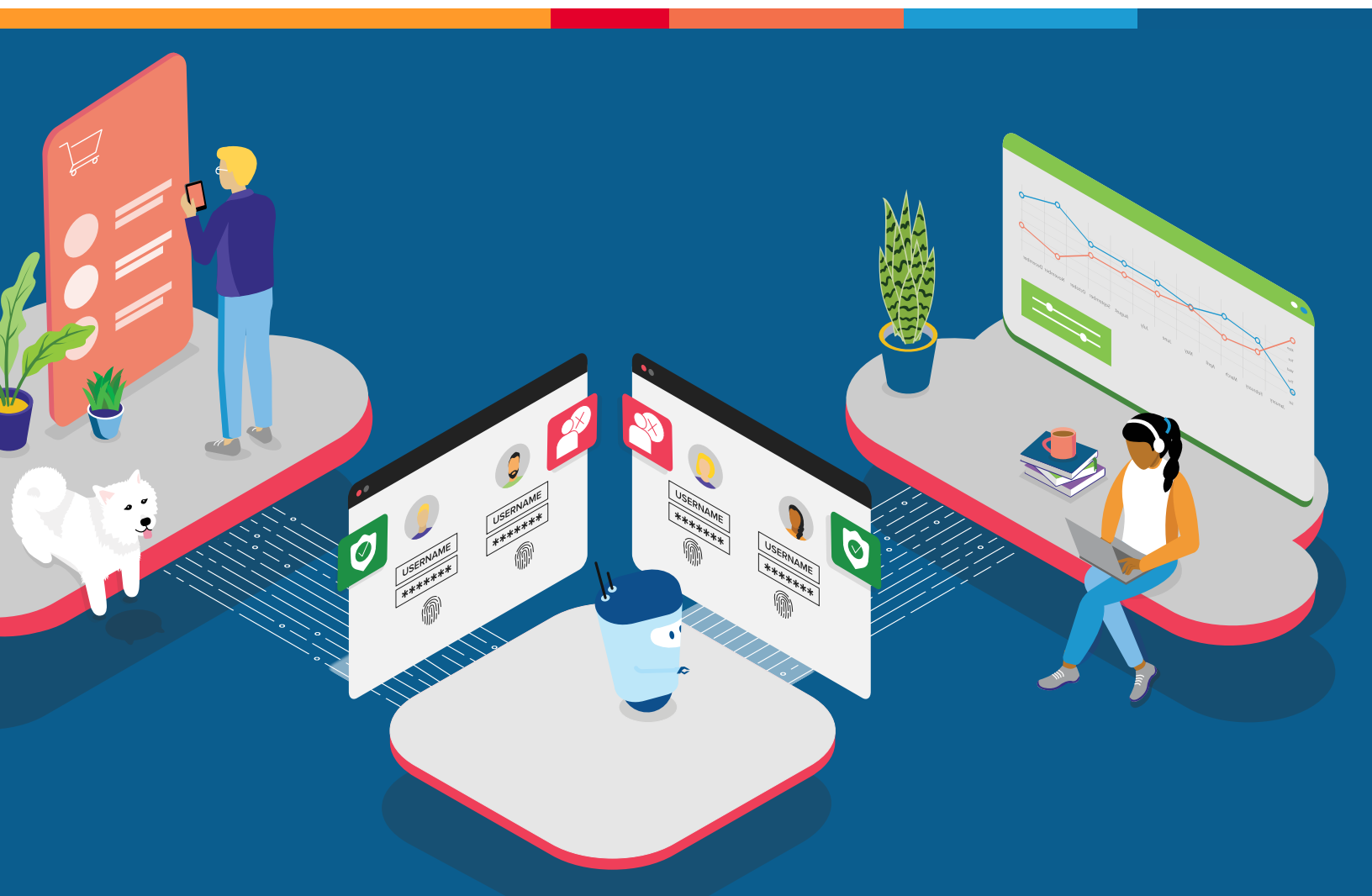# Enabling Modern Apps in Distributed Cloud Environments

Break free from centralized cloud centers and deploy modern applications with container and microservice solutions closer to your users and customers.

Dramatically faster apps
Improve performance and end-user experiences for modern microservices-based applications.

Improved reliability and security
Maximize application reliability and security by hosting apps on a secure global network with built-in load balancing and service discovery.

Simplified infrastructure operations
Reduce the complexity of integrating and managing multiple app infrastructure components (e.g., web application firewalls (WAFs), load balancing, DNS, etc.) and Kubernetes clusters across apps, environments, and vendors.

Enhanced developer experience and faster time to service
Optimize the developer experience by easily plugging into existing continuous integration/continuous delivery (CI/CD) workflows and GitOps tools, allowing for automated workload deployments and rollbacks within minutes.

Unified policy and observability
Apply and maintain unified, consistent configurations and policies across clusters or wherever apps are deployed, with end-to-end observability across distributed workloads.

77% OF RESPONDENTS REPORTED THAT THEY ARE MODERNIZING THEIR APPLICATIONS.

Modernize and Extend Applications to the Cloud and Edge

The digital experience that users expect today requires new thinking, as it necessitates a new distributed architecture to support modern apps that are available everywhere and at all times. In the latest F5 research, 77% of respondents reported that they are modernizing their applications.[1] This means moving to microservices-based application architectures, supporting greater agility, and speeding up development cycles to support faster time to market for new features that help keep up with changing demands.

Modern microservices are increasingly built using distributed app architectures to accommodate growing application usage and improved performance. As users' availability and performance expectations change, organizations are choosing to run lightweight applications on premises at branch and satellite locations to speed up data access and processing of critical telemetry at the edge as opposed to long hauling back to an originating cloud. This has created a distributed computing problem for many organizations as they grapple with the prospects of expanding some workloads further out to the edge or struggle with managing apps and workloads in an already complex, distributed set of environments.

Teams are attempting to do it themselves by cobbling together patchwork solutions that include open-source code and commercially available solutions from public cloud and content delivery network (CDN) providers. They continue to be burdened by:

- The complexity of deploying and operating apps across multiple public, private, telco, and CDN environments.
- The difficulty of maintaining a mismatched stack of app services and consistent policies across apps and environments.
- Code modifications or rewrites to support deployments at the edge required by serverless applications and nascent edge platforms—leading to potential vendor lock-in.
- A lack of unified visibility across an ever-expanding ecosystem.

Deploy and Operate Globally Distributed Apps with Ease

F5 offers a new way to deliver modern apps with unparalleled performance and global scale. With F5® Distributed Cloud Services, you can deploy and run modern containerized apps with cloud-native management, consistent security, and end-to-end observability—wherever they are needed, from the data center to the cloud, on the F5 global network, or at your edge.

Full-featured, Kubernetes-based app platform
Automate provisioning of infrastructure resources, services, and workloads within the F5 network, at the edge, or in the cloud, including self-healing and progressive rollout with health monitoring.

Integration with GitOps and CI/CD tooling
Native support for developer tools, delivering automation for app teams with F5 Terraform as well as public APIs, with the option of using existing CI/CD tools like CircleCI, Spinnaker, or GitLab.

Multi-layered security
Protect networks and applications with distributed denial-of-service (DDoS) mitigation, WAF, automatic API discoverability and zero-trust security.

Centralized observability
Unified visibility from application to infrastructure across heterogeneous edge and cloud deployments to show granular status of application deployments, infrastructure health, and security/ connectivity performance.

Purpose-built global network
A high-performance global backbone, with 20+ global PoPs, spanning 13 metro markets optimized for app-to-app connectivity and global app delivery.

Identity and secrets management
Manage identity lifecycles for each application instance via automatic certificate rotation, delivering uniform identity for applications across different multi-cloud and/or edge environments.

Previously, your engineering and operations teams would need to piece together multiple compute nodes, load balancing, DNS, security, and additional support infrastructure to reach global scale in a distributed environment. F5 Distributed Cloud Services provide the platform, services, and infrastructure to do it all seamlessly. Critical apps become increasingly available to a global audience with a common set of policies and services, and can be deployed efficiently and within minutes.

F5 Distributed Cloud Services consist of Distributed Cloud Mesh and Distributed Cloud App Stack, with a common Distributed Cloud Console control plane that combines with the F5 global network to form a globally distributed, cloud-native application infrastructure. This platform delivers optimized application performance with ease while centralizing operations of distributed compute, network, and storage.

Distributed Cloud App Stack and Distributed Cloud Mesh provide a full-featured app platform that seamlessly integrates with your existing CI/CD tools, without requiring an origin server. This platform delivers a cloud-native environment for hosting your workloads globally with integrated networking and security regardless of the desired location: an Infrastructure as a Service (IaaS) instance in the public cloud, points of presence (PoPs) in the F5 global network, or an existing server at your network edge.

F5 Distributed Cloud Mesh is a Software as a Service (SaaS) solution that provides distributed networking and security services to connect, secure, and observe applications deployed across multiple clouds and edge sites. The unique distributed, proxy-based, and zero-trust architecture of Distributed Cloud Mesh significantly improves security as it provides application access without network access across clusters and sites. Paired with F5's global network backbone, Distributed Cloud Mesh delivers deterministic, reliable, and secure connectivity across multiple clouds and edge sites, and to/from the Internet.

F5 Distributed Cloud App Stack is a virtual Kubernetes platform with the capability to automate deployment, security, and operations of application fleets across diverse environments. It can scale to many clusters and locations with centralized orchestration, observability, and operations to simplify managing a fleet of distributed clusters and reduce dependencies on cloud-hosted origins. Using a distributed control plane running in F5's global infrastructure, Distributed Cloud App Stack delivers a logically centralized cloud that can be managed using industry standard Kubernetes APIs.

F5 Distributed Cloud Console is F5's SaaS-based, multi-tenant operations and observability portal to manage infrastructure, services, and apps. Users can easily monitor platform health and manage the end-to-end lifecycle for distributed workloads on Distributed Cloud Mesh and Distributed Cloud App Stack with efficient operations via granular role-based access control. Capabilities and access can be defined with self-service at the system or project levels or can be entirely shared, supporting greater collaboration and authority across operating teams.

The F5 global network is a high-performance, multi-terabit app-to-app network that's purpose-built to connect and secure distributed workloads with the flexibility to host workloads for enhanced performance. This infrastructure provides advanced networking, security, and application delivery services across all its PoPs. These services are powered by the same Distributed Cloud Mesh and Distributed Cloud App Stack SaaS software that can be deployed in public and private clouds and other edge locations.

This combination of F5 Distributed Cloud Services technology creates a solution that will ease the burden of your ever-expanding app infrastructure and provide a streamlined solution to address app performance without requiring developers/engineers to make changes to the applications themselves. It allows you to seamlessly move latency-sensitive processing (e.g., cookie processing), web-app front ends, and TLS/SSL termination to the F5 global network or your own edge, closer to where critical interactions are taking place.

Whether you choose to run your modern apps on-premises, across public clouds, or leverage other cloud-based Kubernetes services like AKS or EKS, critical workloads can be deployed globally with an optimized footprint and operated with the same consistency, reliability, and security posture, without any servers or complex infrastructure software. This is how F5 Distributed Cloud Services rationalize modern application delivery in the distributed cloud while enabling agility and scale for developers and operations teams.
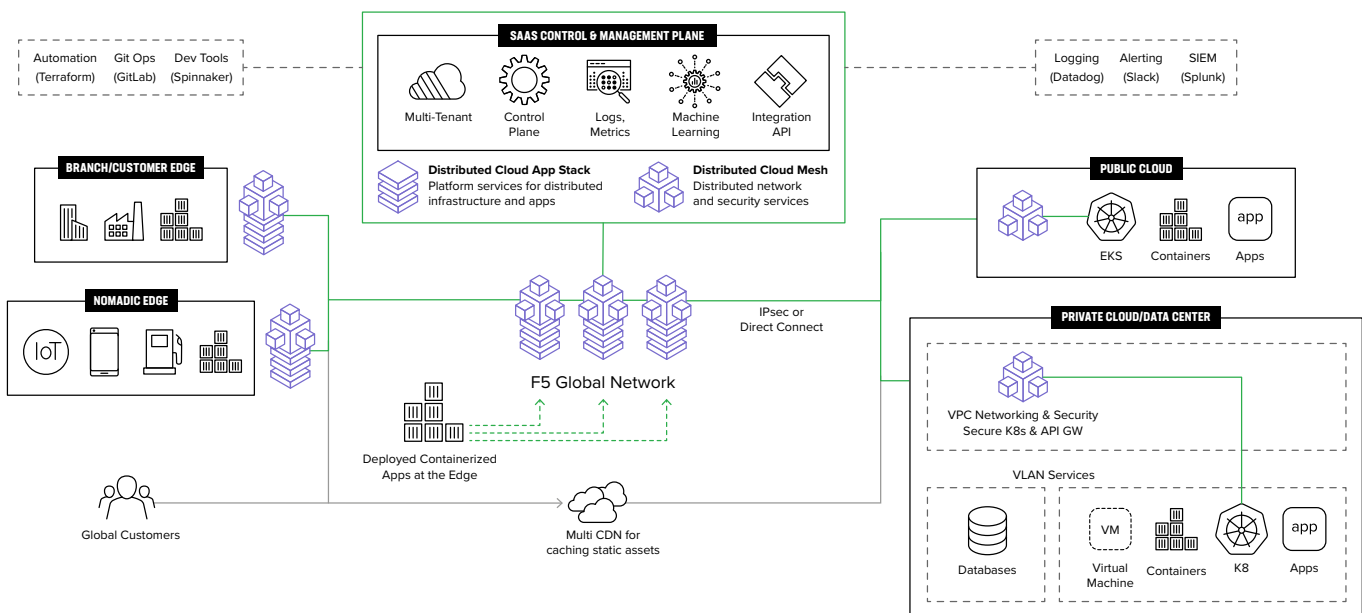

Figure 1: Modern app delivery in the distributed cloud.

Delivering Superior Digital Experiences Demands a New Distributed App Architecture

Achieving the high-performing, responsive app experiences that today's users expect requires moving modern apps closer to your users. F5 Distributed Cloud Services can help.

Delivering fast and available modern applications across hybrid cloud environments today is table stakes for success. With the emergence of new multi-cloud and edge-based architectures, more than three-quarters of respondents are already using, or have plans to use, the edge to capture benefits related to application deployment, performance, and data availability for various use cases.[2] These benefits include improving performance, speeding data collection and analytics, supporting IoT, and engaging capabilities for real-time or near real-time processing. Organizations across industries realize that these new distributed topologies will become their new reality: fraught with complexities, but critical to achieving customer success.

F5 Distributed Cloud Services offer a better way to deliver modern application services with unparalleled performance and availability at scale. Organizations can deploy and run containers and microservices applications anywhere customers demand service—from data centers or colocation sites to cloud partners, and out to the edge—to offer cloud-native operations, consistent security, and end-to-end observability.

The latest F5 research shows more than three-quarters of respondents are already using, or have plans to use, the edge to capture benefits related to application deployment, performance, and data availability.

To learn more, visit the webpage Distributed Cloud Services for Modern App Development.

> THE LATEST F5 RESEARCH SHOWS MORE THAN THREE-QUARTERS OF RESPONDENTS ARE ALREADY USING, OR HAVE PLANS TO USE, THE EDGE TO CAPTURE BENEFITS RELATED TO APPLICATION DEPLOYMENT, PERFORMANCE, AND DATA AVAILABILITY.

[1] The State of Application Strategy: Enabling Adaptive Apps
https://www.f5.com/company/blog/state-of-application-strategy-adaptive-apps

[2] Ibid.