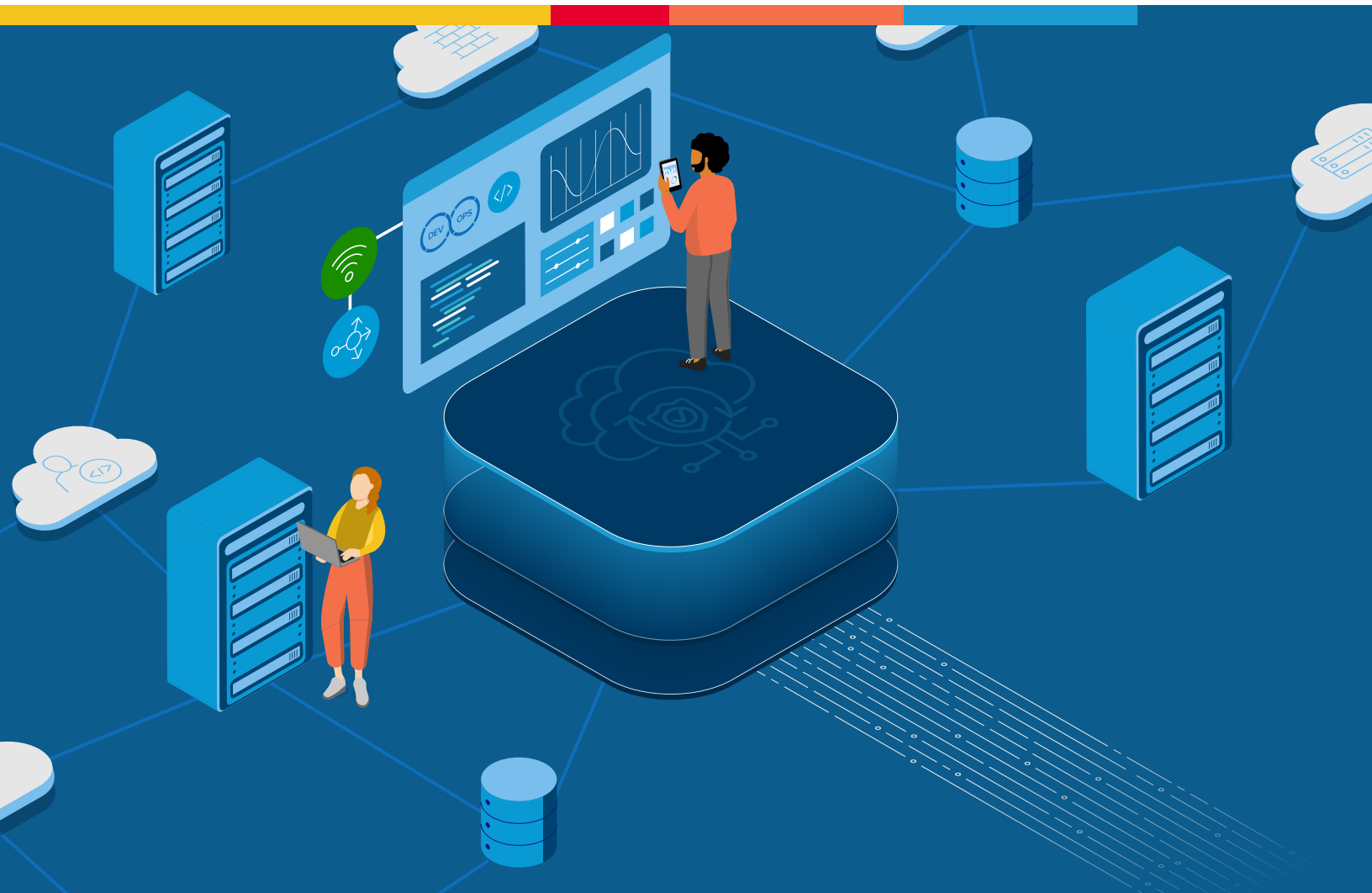




# An Introduction to BIG-IP Next—F5's Next-Generation BIG-IP Software

This is a forward-looking document intended to provide insight into the value F5's next generation BIG-IP software will deliver as a fully developed product one to two years after general availability. As such, not all capabilities discussed in this document will be available immediately but will be introduced over time as the software matures.



## KEY BENEFITS

- Accelerate time-to-market via a highly automatable, API first-architecture
- Reduce cloud total cost of ownership (TCO) with optimized, right-sized instances
- Support an extensive app portfolio based on a highly scalable control plane
- Reduce application downtime with rapid, hitless upgrades
- Maintain a cutting-edge security posture with accelerated feature delivery
- Continue using the advanced suite of app services you know and trust

**Application portfolios, the environments they're deployed in, and the tools and processes surrounding them are evolving at an unprecedented pace, becoming increasingly complex, multi-faceted and autonomous in nature.**

Present-day applications are seldom confined solely to an organization's in-house data center; rather they're also increasingly distributed across cloud and remote edge locations to minimize latency, improve user experience, and bolster geographic redundancy. This architectural approach inherently heightens operational complexity and security risks—issues further compounded by the sheer magnitude of modern application portfolios. As a result, operations, security, and development teams are progressively depending more on automation to simplify deployments and day-to-day operations across these ever-expanding application complexities. Almost every company is undergoing these technological changes as they embrace digital transformation and exploit applications to innovate and gain competitive advantages—and almost every company is fighting an uphill battle to successfully architect their distributed cloud.

The F5® BIG-IP® product suite is a trusted and versatile component within many on-premises and cloud architectures today, providing the advanced application delivery and security services needed to ensure the availability, performance, and protection of apps running in any environment. As the application landscape continues to evolve, BIG-IP must also adapt to continue delivering value throughout the distributed cloud era. As such, F5 is delivering the next generation of BIG-IP software that meets the needs of the future application landscape, with this introduction providing insight into the value being delivered through F5's BIG-IP Next software.

## BIG-IP Next—The Next Generation BIG-IP Software

**AT ITS CORE, IT'S STILL THE SAME BIG-IP THAT F5 CUSTOMERS KNOW AND TRUST, SIMPLY DESIGNED AND REARCHITECTED FOR THE FUTURE.**

At its core, it's still the same BIG-IP that F5 customers know and trust, simply designed and rearchitected for the future. BIG-IP Next is the next generation BIG-IP software built to offer greater automation opportunities, scalability, and ease-of-use for organizations running applications on-premises, in the cloud, or out at the edge. Powerful declarative APIs are the foundation for BIG-IP Next's API-first design, making it faster and easier for DevOps, NetOps, and other BIG-IP-reliant teams to manage and automate their BIG-IP deployments.

BIG-IP NEXT COMPLETES  
THE TRANSITION AWAY  
FROM IMPERATIVE APIS  
(iCONTROL REST) TO  
A MORE POWERFUL,  
FLEXIBLE AND ENTIRELY  
DECLARATIVE API MODEL.

A completely rearchitected software layer built on a modern framework provides the basis for significantly improved control plane scale and performance, reduced cloud footprint for lower operational costs, and rapid instance upgrades. Carrying forward the comprehensive suite of advanced BIG-IP functionality developed over the past 20 years, BIG-IP Next continues to deliver everything from application security and access controls to local and global traffic management—and availability across the same breadth of deployment and consumption models as its predecessor.

## Accelerate Time-To-Market via a Highly Automatable, API-First Design

Digital transformation has drastically increased the number of applications companies have to maintain, forcing many to operationalize application lifecycle management using automation. As AppDev teams accelerate their release cycles, the burden on NetOps and Platform teams increases correspondingly and can easily reach a tipping point. To reduce this burden, BIG-IP Next is API-first by design, with automation-driven device onboarding and application services configuration seamlessly achievable using declarative APIs. BIG-IP Next completes the transition from imperative APIs (iControl REST)—where individual commands must be arduously sequenced together to automate simple tasks—to a more powerful, flexible, and entirely declarative model where desired end-state declarations centered around use cases are all that is required to automatically stand-up or configure instances. This shift makes it faster to deploy and configure applications and also replaces the need for extensive domain knowledge—making it easier for administrators to automate tasks.

F5's Declarative API (Application Services 3 - AS3) is carried forward from BIG-IP and continues to be the de-facto API for L4-L7 app services configuration; making it possible to configure all the services required for an application in a single declarative API call. AS3 declarations are both forward and backward compatible between BIG-IP and BIG-IP Next, allowing reuse of existing declarations when migrating applications between the BIG-IP software generations. For device onboarding, BIG-IP Next leverages a declarative API similar to BIG-IP TMOS' Declarative Onboarding (DO) Extension—which allows automated device instantiation. Both APIs are now built into the BIG-IP Next software so that extension installation is no longer required. Compatibility with leading automation and orchestration tools, such as Ansible and Terraform will also be maintained, allowing DevOps or developer teams to integrate app services deployments as part of their CI/CD pipelines. Additionally, F5's Declarative API supports multi-threading which enables tasks from multiple orchestrators to be processed concurrently; benefiting multi-tenant deployments.

AS ORGANIZATIONS BUILD OUT COMPLEX CLOUD ARCHITECTURES FOR THEIR EXPANDING APP PORTFOLIOS, THE CONTROL PLANES OF MANY SYSTEMS RESPONSIBLE FOR PROCESSING APPLICATION TRAFFIC ARE UNDER MOUNTING STRAIN.

## Manage Complex App Portfolios with a Control Plane Built for Peak Scale

As organizations build out complex cloud architectures for their expanding app portfolios, the control planes of many systems responsible for processing application traffic are under mounting strain. The rising volume of security policies, increased complexity of monitoring requirements, and desire to automate more day-to-day operations can cause many control planes to struggle under increasing load.

In light of this trend, the BIG-IP Next's control plane has been constructed to handle the most complex, resource-intensive application configurations. Immense object scale ensures BIG-IP Next can manage vast configurations consisting of many more configuration objects than BIG-IP, while the ability to dedicate additional compute resources to control plane functions safeguards against resource exhaustion in all but extreme circumstances. This combination of adjustable control plane resources and improved object scale produces a highly performant, resilient, and reliable control plane.

## Reduce Application Downtime with Rapid and Hitless Upgrades

Updating software is often considered a menial, time-consuming task, with many teams putting off doing so until a new feature is needed or they're forced to when the software end-of-lifecycle looms. Maintaining the latest software releases should be an imperative for any solution since aging code is almost always more susceptible to exploitation of vulnerabilities, thanks to the lack of the latest and greatest security capabilities. Unfortunately, many software upgrade processes currently require planned application down time in the form of maintenance windows—making upgrades more difficult to perform.

For these reasons, the process of upgrading BIG-IP Next to newer versions is designed to be both fast and as painless as possible. By eliminating the need for lengthy maintenance windows and reducing the likelihood of compatibility issues or other complications. Some upgrades will be hitless in nature. That means they can be performed while maintaining all existing operations and without disrupting traffic flows or diminishing application availability. The upgrade process for any BIG-IP Next instance will be possible in minutes, if not seconds, with seamless version roll-back available should it be required.

UPON MIGRATING WORKLOADS TO THE CLOUD, 79% OF COMPANIES REPORTED THAT MANAGING CLOUD SPEND IS A CRITICAL CHALLENGE THEY FACE WHEN TRYING TO KEEP WITHIN ANNUAL BUDGETS.<sup>1</sup>

# Lower Cloud Operational Costs with Optimized, Right-Sized Instances

For years, IT teams have been under growing pressure to cut costs while being expected to deploy more services in shorter timeframes. Upon migrating workloads to the cloud, 79% of companies reported that managing cloud spend is a critical challenge they face when trying to keep within annual budgets.<sup>1</sup> In most cases the cost of virtual machine (such as AWS EC2) usage represents the bulk of users' monthly cloud spend, making this the first place teams look for optimizations.

Appreciating this, BIG-IP Next is architected to reduce cloud TCO in several ways. Application delivery and security functions are optimized to use significantly less memory which will allow the solution to be deployed on smaller, less expensive VMs, thus reducing annual cost. Additionally, the containerized nature of the BIG-IP Next core splits feature-modules into individual units, permitting teams to pick, choose, and deploy only the functions required. This approach allows right-sized instances to be created with smaller footprints, faster spin-up times, and lower operating expense.

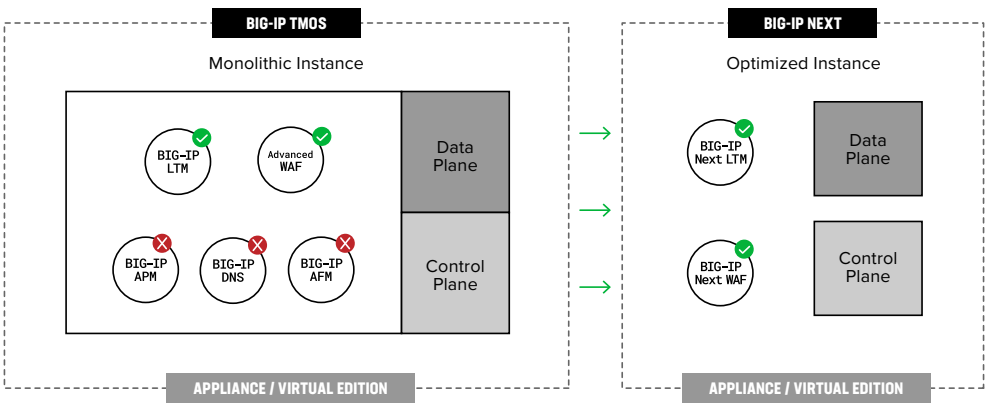


Figure 1: Reduce virtual instance footprints by deploying only the desired solution capabilities

THE THREAT LANDSCAPE  
CONTINUES TO EVOLVE  
RAPIDLY WITH NEW  
ATTACK VECTORS  
DISCOVERED ALMOST  
DAILY AS ATTACKERS  
SEEK TO TAKE ADVANTAGE  
OF NEW AND EXISTING  
DEPLOYED APPLICATIONS.

## Maintain a Cutting-Edge Security Posture by Accelerating Feature Delivery

The threat landscape continues to evolve rapidly with new attack vectors discovered almost daily as attackers seek to take advantage of new and existing applications. It's therefore critical that mitigating counter-defenses are made available and implemented as quickly as possible to address both known and unknown threats.

Transitioning to a highly agile development and delivery process centered around driving higher software quality, BIG-IP Next software releases containing incremental features and software patches will be delivered every three months—twice as often as BIG-IP TMOS feature releases. As a result, security teams can quickly obtain and implement protective measures to ensure their security posture keeps pace with—and even outpaces—the constantly evolving threat landscape.

## Continue to Leverage the Comprehensive App Delivery and Security Capabilities You Know and Trust

Despite organizations gradually shifting to more modern, distributed architectures, all applications will continue to rely on a core set of application services for the foreseeable future. For over 20 years, mission-critical applications have depended globally on an extensive suite of BIG-IP application delivery and security services. The majority of these capabilities will be migrated to the next generation BIG-IP software. The following product modules and ensuing use cases will be delivered with BIG-IP Next, providing next-generation replacements for existing BIG-IP offerings.

- **F5® BIG-IP® Local Traffic Manager (LTM):** Intelligently manage and load balance traffic to ensure apps are highly performant and available
- **F5® BIG-IP® DNS:** Hyperscales and secures infrastructure during high query volumes and DDoS attacks while providing global server load balancing to ensure app availability and performance across environments
- **F5® BIG-IP® Next WAF:** Defends applications against the latest OWASP Top 10, complex application layer, and API attacks
- **F5® BIG-IP® Next Access:** Secures and simplifies user access to applications and data in any environment from any device or location
- **F5® BIG-IP® Next Edge Firewall:** Protects the network edge and core from incoming threats, including complex DDoS and protocol attacks

AFFORDING DEPLOYMENT FLEXIBILITY SPANNING CLOUD, EDGE, AND ON-PREMISES, THE BIG-IP NEXT SOFTWARE WILL BE SUPPORTED ACROSS A RANGE OF DEPLOYMENTS TO SATISFY THE REQUIREMENTS OF ANY APPLICATION.

- **F5® BIG-IP® Next SSL Orchestrator:** Maximizes infrastructure efficiency and security with encryption, decryption, and traffic steering through multiple inspection devices
- **F5® BIG-IP® Next CGNAT:** Enables fast, scalable, and secure IPv4/IPv6 address translation and management
- **F5® BIG-IP® Next Policy Enforcer:** Optimizes network performance through effective policy implementation and management

Beyond the continued availability of these key functions, critical features in use by many BIG-IP customers today such as iRules, Container Ingress Services, and telemetry streaming will also be maintained.

## Implement BIG-IP Next Wherever and However Required via Flexible Deployment and Licensing Options

Affording deployment flexibility spanning cloud, edge, and on-premises, the BIG-IP Next software will be supported across a range of deployments to satisfy the requirements of any application:

- **VELOS:** Powerful next-generation chassis system with the agility and scale of a modern architecture
- **rSeries:** High performance, API-first appliance designed to meet the needs of traditional and emerging apps
- **Virtual Edition:** Cloud-optimized virtual instance delivering the same extensive suite of features in public or private cloud environments
- **Cloud-Native Network Functions (CNF):** Network functions implemented as containers and orchestrated by Kubernetes to provide new levels of granularity

To align with differing purchasing directives, BIG-IP Next may be licensed in a number of ways including subscription, utility, and flexible consumption programs:

- **Subscription:** Renewable 1-3 year subscriptions affording upfront savings plus access to F5 premium support
- **Flexible consumption program:** Three-year enterprise agreement empowering self-service licensing for maximum architectural flexibility
- **Utility:** Pay-as-you-go model with no long-term commitments plus access to F5 premium support
- **Perpetual:** One-time CapEx investment providing complete solution ownership

BIG-IP Next also boasts an improved licensing mechanism designed to simplify and accelerate license registration in support of increasingly automated environments, while also providing heightened visibility into license usage.

## **Achieve Centralized Control and Visibility with BIG-IP Next Central Manager**

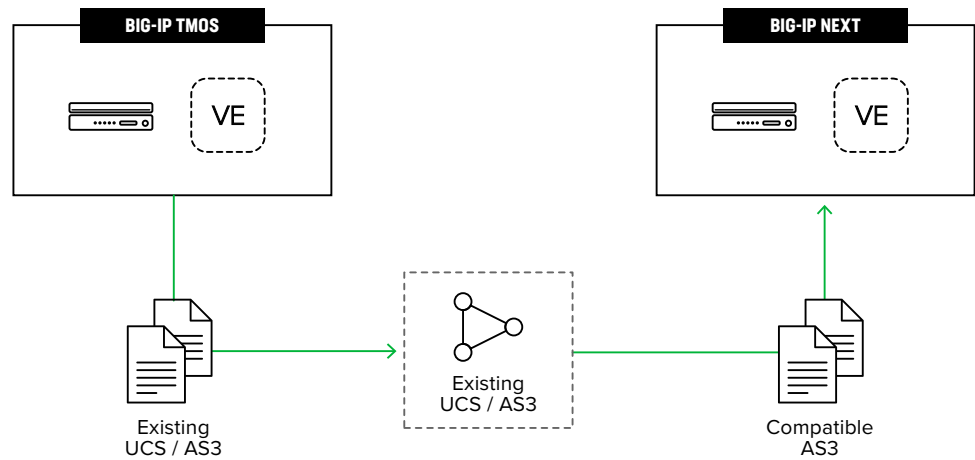
Designed to simplify management, monitoring and visualization of BIG-IP Next Infrastructure and services through an intuitive user interface, Central Manager reduces the time and complexity needed to perform critical tasks and workloads. Central Manager is the single source of truth for managing workflows, ensuring consistency and enforcing compliance. Built on a highly scalable, modern architecture, Central Manager can run as a Virtual Edition on vSphere, KVM or Open stack on an x86 server to most cost effectively manage all your BIG-IP Next instances. Key functionality includes:

- Full Instance lifecycle management
- Policy, compliance management and security enforcement
- GUI and API driven service provisioning and troubleshooting
- Detailed visibility and analytics
- Automation leveraging Application Services Extension (AS3) and F5 Application Services Template (FAST)

## **Seamless Migration to BIG-IP Next with the Journeys Migration Tool**

Developed to facilitate effortless shifts between BIG-IP solutions, the [F5 Journeys Migration Tool](#) can be used to simplify and accelerate migrations to BIG-IP Next. By converting existing BIG-IP configurations into configurations that are compatible with BIG-IP Next, F5's Journeys Migration Tool drastically reduces the time and effort required to transition. Using Application Services 3 Extension (AS3) as the basis for this process, the tool transforms User Configuration Set (UCS) files or AS3 declarations describing current BIG-IP configurations into AS3 declarations that replicate these configurations on BIG-IP Next. This process can be performed for entire BIG-IP instances, or on a per-app basis, allowing migrations to be performed at the user's pace.





**Figure 2:** Accelerate migrations to BIG-IP Next using the F5 Journeys Utility

Interested to learn more or try out F5's next generation BIG-IP software? Contact your F5 account manager or [contact F5 sales](#) today for more information.

<sup>1</sup> FLEXERA 2021 State of the Cloud Report, 2021, found at <https://info.flexera.com/CM-REPORT-State-of-the-Cloud>

