SOLUTION OVERVIEW

# 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 beyond general availability. As such, not all capabilities discussed in this document will be available immediately but may be introduced over time as the software matures.

KEY BENEFITS

Accelerate and automate application deployments through declarative configuration templates and APIs.

Maintain a state-of-the-art security posture with accelerated software release cycles that deliver cutting-edge security capabilities, faster software patches and improved software quality.

Perform major software upgrades in minutes, shortening or entirely removing the need for maintenance windows and application downtime.

Facilitate vast, dynamic application portfolios and their most complex configurations leveraging BIG-IP Next's superior control plane.

Gain clear insight into the health and performance of your applications with data-rich application dashboards and analytics.

Reduce operational complexity by centralizing all management and lifecycle tasks for your entire BIG-IP Next portfolio within a single console.

Continue using the advanced suite of application delivery and security services you know and trust.

Streamline day-to-day operational tasks with BIG-IP Next's modern and unified user interface.

**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. Today's applications are seldom confined solely to an organization's in-house data center; rather, they're 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 utilize applications to innovate and gain competitive advantages—and almost every company is fighting an uphill battle to deliver, secure, and optimize apps spanning these distributed architectures.

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. However, as the application landscape continues to progress, BIG-IP must also adapt and evolve. As such, F5 is delivering the next generation of BIG-IP software to better support the future application landscape.

## 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 modernized and optimized for the future. F5® BIG-IP® Next™ is the next generation of BIG-IP software built to reduce operational complexity, improve performance, strengthen security, and enhance observability. A modernized software framework provides the foundation for significantly improved control plane scale and performance, rapid service upgrades, and reduced instance footprints in cloud environments. BIG-IP Next also reimagines operational workflows by introducing a centralized, API-centric and automation-friendly framework, making it faster and easier for DevOps, NetOps, SecOps, and other BIG-IP reliant teams to deploy and manage critical application services.  With an accelerated software development cadence, BIG-IP Next keeps pace with the evolving threat landscape by delivering new protective functionality and vulnerability patches faster than ever before, ensuring the security of your apps and environments.

Carrying forward the comprehensive suite of advanced BIG-IP TMOS functionality developed over the past 20 years, BIG-IP Next continues to deliver everything from local and global traffic management and DNS Services to application security and access controls—along with the same breadth of deployment form factors and consumption models as its predecessor.

AT ITS CORE, IT'S STILL THE SAME BIG-IP THAT F5 CUSTOMERS KNOW AND TRUST, SIMPLY MODERNIZED AND OPTIMIZED FOR THE FUTURE

# BIG-IP Next Central Manager: Centralized Control Over BIG-IP Next Instances

Every BIG-IP Next deployment consists of two key components: BIG-IP Next instances and the F5® BIG-IP® Next™ Central Manager. BIG-IP Next instances are generally deployed close to applications, providing the data plane and control plane necessary to direct application traffic, block threats, and enforce specific policies. The BIG-IP Next Central Manager delivers the management plane, capable of centrally managing hundreds of BIG-IP Next instances to significantly reduce operational complexity. After BIG-IP Next instances have been deployed, the BIG-IP Next Central Manager is the sole interface for managing all connected BIG-IP Next instances, which can be accomplished via either the BIG-IP Next Central Manager's GUI, CLI, or API. BIG-IP Next Central Manager provides a centralized console for gaining insights into application and device health, automating application deployments and policy changes, and performing all instance lifecycle tasks for BIG-IP Next instances deployed anywhere across distributed environments..

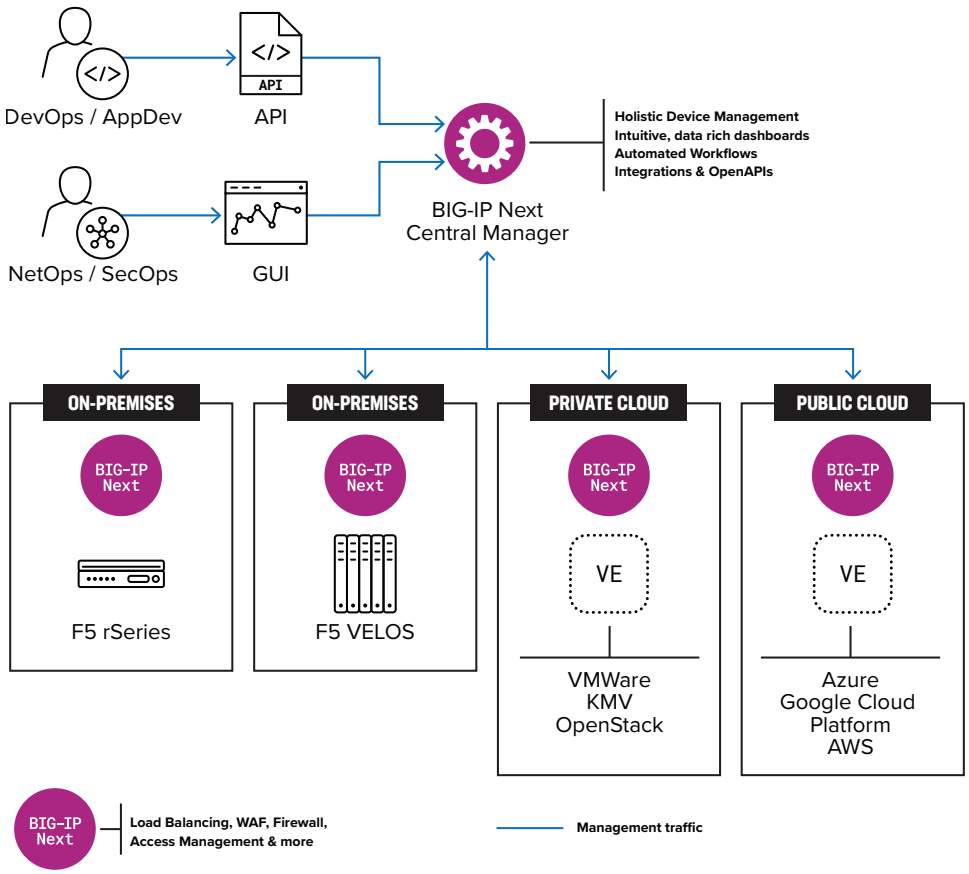


**Figure 1:** Centralized management and observability for BIG-IP Next Instances with BIG-IP Next Central Manager

## Streamline Operations and Automation with Declarative APIs and Configuration Templates

AFTER BIG-IP NEXT INSTANCES HAVE BEEN DEPLOYED, THE F5 BIG-IP NEXT CENTRAL MANAGER IS THE SOLE INTERFACE FOR MANAGING ALL CONNECTED BIG-IP NEXT INSTANCES, WHICH CAN BE ACCOMPLISHED VIA EITHER THE BIG-IP NEXT CENTRAL MANAGER'S GUI, CLI, OR API.

Digital transformation has dramatically increased the number of applications companies have to maintain, compelling many to operationalize application lifecycle management through automation. As application development teams accelerate their release cycles, the burden on operations and platform teams increases. To reduce this burden, BIG-IP Next has been designed to be entirely automatable, with device onboarding and application services configuration seamlessly achievable using high-performance declarative APIs and configuration templates.

BIG-IP Next completes the transition away 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 configure instances. This shift makes deploying and configuring applications faster 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 primary API for L4-L7 app services configuration, automating configurations required for all application services in a single declarative API call. All the benefits of a declarative configuration model can also be realized on BIG-IP Next through F5 App Services Templates (FAST), which provide a fast and easy way to deploy applications with minor inputs and minimal system knowledge. AS3 declarations and FAST templates used to configure BIG-IP TMOS devices can be modified by the Journeys Migration Service to be compatible with BIG-IP Next, allowing reuse of existing declarations and templates when migrating applications to BIG-IP Next.

Both AS3 and FAST templates are fully integrated within BIG-IP Next software so that extension installation is no longer required. Compatibility with leading automation and orchestration tools, such as Ansible and Terraform is also 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.

BIG-IP NEXT HAS BEEN DESIGNED TO BE ENTIRELY AUTOMATABLE, WITH DEVICE ONBOARDING AND APPLICATION SERVICES CONFIGURATION SEAMLESSLY ACHIEVABLE USING HIGH-PERFORMANCE DECLARATIVE APIS AND CONFIGURATION TEMPLATES.

## Reduce Application Downtime with Rapid and Hitless Upgrades

Updating software is often considered a tedious and time-consuming task, with many teams postponing it until a new feature is required or until they're compelled to do so as the end of the software lifecycle approaches. Maintaining the latest software releases should be an imperative for any solution since aging code is almost always more susceptible to exploitation of vulnerabilities due to the longer period of time attackers have to identify those vulnerabilities. Software upgrades are often lengthy processes that require sizeable maintenance windows and significant application downtime. For these reasons, the process of upgrading BIG-IP Next to newer versions is designed to be as fast and as painless as possible. Major BIG-IP Next software upgrades can be performed much faster and with only minor disruption to application availability. When less critical software upgrades, such as software patches and control plane upgrades are required, these upgrades can be achieved while maintaining all existing operations and without disrupting traffic flows. These upgrades are hitless in nature. All BIG-IP Next software upgrades are possible in a matter of minutes, if not seconds, with seamless version rollback available should it be required.

## Manage Complex App Portfolios With A Control Plane Built for Extreme 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 complex configuration policies, granular monitoring requirements, and the desire to automate most aspects of day-to-day operations can result in control planes being overloaded. In light of this trend, BIG-IP Next's control plane has been rearchitected to handle the most complex, resource intensive application configurations operating under highly automated conditions.

Immense object scale ensures BIG-IP Next can manage vast configurations consisting of many more objects than BIG-IP TMOS, while the ability to dedicate additional compute resources to control plane functions safeguards against resource exhaustion. This combination of adjustable control plane resources and improved object scale produces a highly performant, resilient, and reliable control plane. The BIG-IP Next control plane is also capable of processing up to 40 times more API requests per second than its predecessor, while implementing configuration changes in single-digit milliseconds, making it well-suited to highly orchestrated and dynamic environments.

In addition to greater scalability, the BIG-IP Next control plane is also more secure than ever before. The rearchitected control plane implements a new Zero Trust Architecture (ZTA) model, helping to make it much less susceptible to common vulnerabilities and exposures.

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## Right-size Software Instances to Reduce Costs, Vulnerabilities and spin-up times

MAJOR BIG-IP NEXT SOFTWARE UPGRADES CAN BE PERFORMED MUCH FASTER AND WITH ONLY MINOR DISRUPTION TO APPLICATION AVAILABILITY

The modern software design of BIG-IP Next allows for the creation of custom software instances that contain only the necessary product functionality required to enable desired use cases. As such, software instances that would have been unnecessarily large with BIG-IP TMOS—requiring extra storage costs and taking longer to spin up—can be shrunk down to contain only essential code, thus reducing instance footprints, storage costs, and spin up times. By deploying instances containing fewer product modules, this architectural shift also lowers the risk of software vulnerabilities by decreasing the possible threat surface attackers can attempt to exploit.

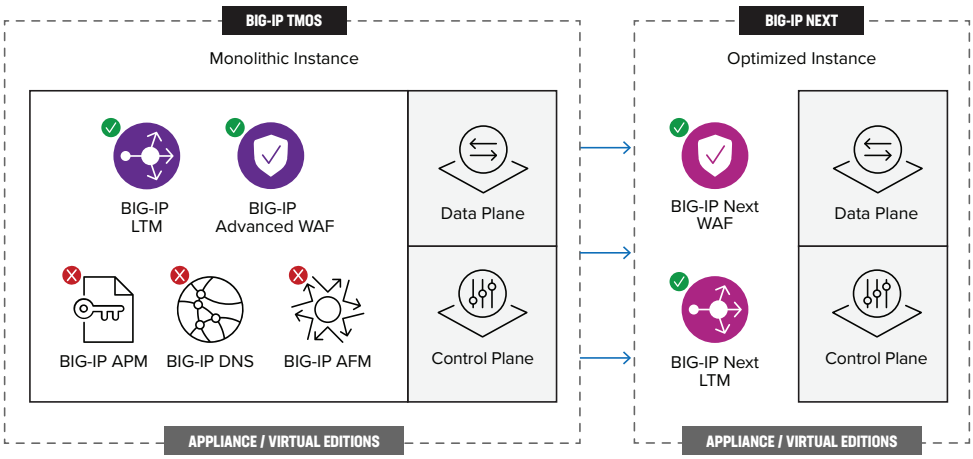


**Figure 2:** Reduce BIG-IP Next software footprints by deploying only the desired product modules

## Maintain a Cutting-Edge Security Posture With Accelerated Software Development

The threat landscape continues to rapidly evolve with new attack vectors discovered almost daily. It's therefore critical that protective counter-defenses are made available and implemented as quickly as possible to mitigate these emerging threats. BIG-IP Next transitions to a highly agile software development and delivery process centered around driving higher quality software. As a result, BIG-IP Next software releases containing incremental security capabilities will be made available on a much more frequent cadence. When coupled with BIG-IP Next's seamless software upgrades, security teams will be able to quickly obtain and implement protective measures to ensure their security posture keeps pace with–and even outpaces–the constantly evolving threat landscape. This accelerated software development process will also enable F5 to react faster to newly discovered software vulnerabilities, allowing software patches to be developed, released, and implemented in as little as 24 hours.

# Elevate Application Visibility Across Environments

BIG-IP NEXT'S CONTROL PLANE CAN PROCESS UP TO 40 TIMES MORE API REQUESTS PER SECOND WHILE IMPLEMENTING CONFIGURATION CHANGES IN SINGLE-DIGIT MILLISECONDS

As apps are increasingly distributed across environments, organizations are finding it more difficult to consolidate and prioritize crucial telemetry data regarding the health and security of those workloads. The hub and spoke relationship between BIG-IP Next Central Manager and BIG-IP Next instances allows teams to obtain a comprehensive, bird's-eye view into the health, performance, and security of entire application portfolios from a single dashboard. Critical events can be rapidly identified at the BIG-IP Next instance level and funneled up to the BIG-IP Next Central Manager, enabling teams to quickly prioritize and respond to events in order of urgency. Granular dashboards provide deep visibility into the status of individual workloads and BIG-IP Next instances, helping to inform decision making, accelerate issue troubleshooting, and mitigate attacks. Alert thresholds can be customized in the BIG-IP Next Central Manager console based on pre-defined security and performance tolerance levels. BIG-IP Next Central Manager can also schedule reports to be automatically created and exported for auditing purposes. For users familiar with existing third-party visualization and analytics software, BIG-IP Next Central Manager also supports real-time telemetry streaming utilizing OpenTelemetry, allowing data exportation to all popular tools including Splunk, Grafana, and many more.

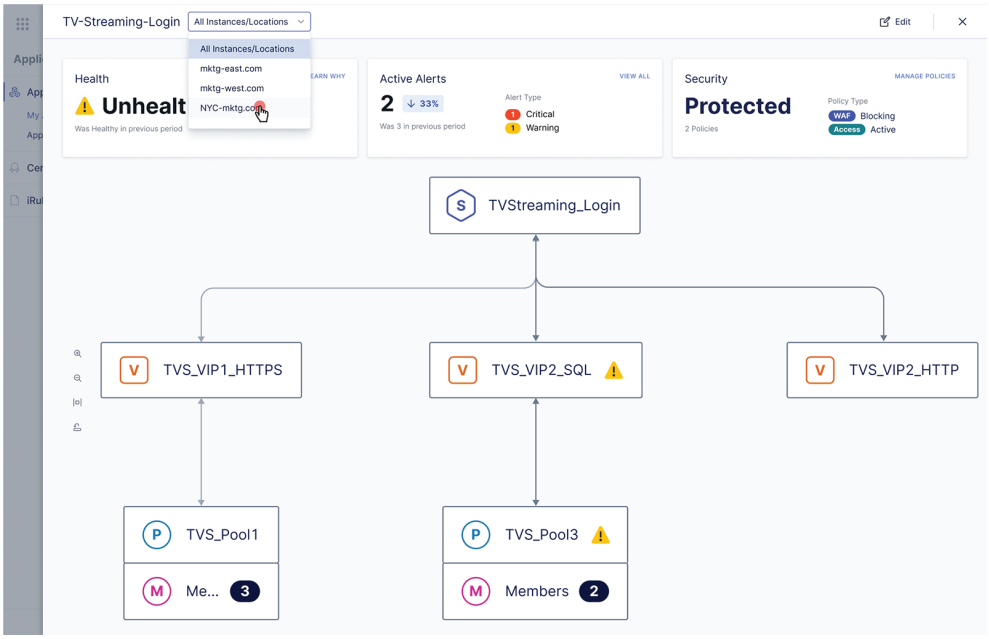


**Figure 3:** BIG-IP Next Central Manager provides birds-eye view visibility into the health and status of applications

GRANULAR DASHBOARDS PROVIDE DEEP VISIBILITY INTO THE STATUS OF INDIVIDUAL WORKLOADS AND BIG-IP NEXT INSTANCES, HELPING TO INFORM DECISION MAKING, ACCELERATE ISSUE TROUBLESHOOTING, AND MITIGATE ATTACKS.

## Increase Application Resiliency Through Instance Autoscaling

User demand for applications can fluctuate greatly and is influenced by various factors, including time of day, seasonality, and one-time events. In scenarios where application usage is highly unpredictable, operations teams may be challenged to always satisfy demand without incurring extra expense due to over-provisioning. As a solution to this, some organizations elect to implement autoscaling architectures.

Under the control of BIG-IP Next Central Manager, BIG-IP Next instances can be automatically scaled in and out to increase or decrease traffic processing capacity. Autoscaling can be achieved on a local or global scale, enabling BIG-IP Next instances to be spun up or down to match demand across complex, geographically distributed architectures, ensuring that application availability is maintained, and costs are optimized at all times.

## 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 on an extensive suite of BIG-IP application delivery and security services. The majority of these capabilities are being migrated to BIG-IP Next with the following product modules providing next-generation replacements for existing BIG-IP offerings and their use cases:

- F5® BIG-IP® Next™ Local Traffic Manager™ (LTM): Intelligently manage and load balance traffic to ensure apps are highly performant and available.
- F5® BIG-IP® Next™ DNS: Hyperscales and secures infrastructure during high query volumes and against DNS DDoS attacks while providing global server load balancing to ensure app availability and performance across environments.
- F5® BIG-IP® Next™ WAF: Secures applications and APIs against the latest OWASP Top 10 security risks, mitigates L7 DoS attacks, and protects APIs, including GraphQL, from attack.
- F5® BIG-IP® Next™ Access: Reduces risk by moving authentication and authorization to a hardened security solution. With access-as-code, integrate API-centric access security within the development process while also enabling modern authentication and multifactor authentication (MFA) for all applications, including classic and custom applications.

F5'S JOURNEYS DRASTICALLY REDUCES THE TIME AND EFFORT REQUIRED TO MIGRATE APPLICATIONS FROM BIG-IP TMOS TO BIG-IP NEXT

- F5® BIG-IP® Next™ SSL Orchestrator®: Centralizes decryption of all encrypted traffic while intelligently managing the flow of encrypted traffic across your entire security stack, ensuring optimal crypto processing performance.
- F5® BIG-IP® Next™ Edge Firewall: Protects the network edge and core from incoming threats, including complex DDoS and protocol attacks.
- F5® BIG-IP® Next™ Policy Enforcer: Provides intelligent Layer 4–7 traffic steering, network intelligence, and dynamic control of your network resources through subscriber- and context-aware solutions.
- F5® BIG-IP® Next™ Carrier-Grade NAT (CGNAT): Enables service providers to transparently support and interoperate IPv4 and IPv6 devices and content.

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

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

With 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 all applications:

- **VELOS**: Powerful next-generation chassis and blade system with the agility and scale of a modern architecture
- **rSeries**: High-performance, fully automatable appliance designed to meet the needs of traditional and emerging apps
- **Virtual Edition**: Cloud-optimized virtual instance delivering the extensive suite of BIG-IP Next capabilities in public or private cloud environments

To align with differing purchasing directives, BIG-IP Next may be licensed in a number of ways, including:

- **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.

## Seamless Migrations with the BIG-IP Next Central Manager Migration Service

The BIG-IP Next Central Manager Migration Service helps facilitate effortless application migration from BIG-IP TMOS to BIG-IP Next. By converting existing BIG-IP TMOS configurations into declarative configurations that are compatible with BIG-IP Next, the Migration Service drastically reduces the time and effort required to transition applications between the two solutions while also simplifying future configuration changes.

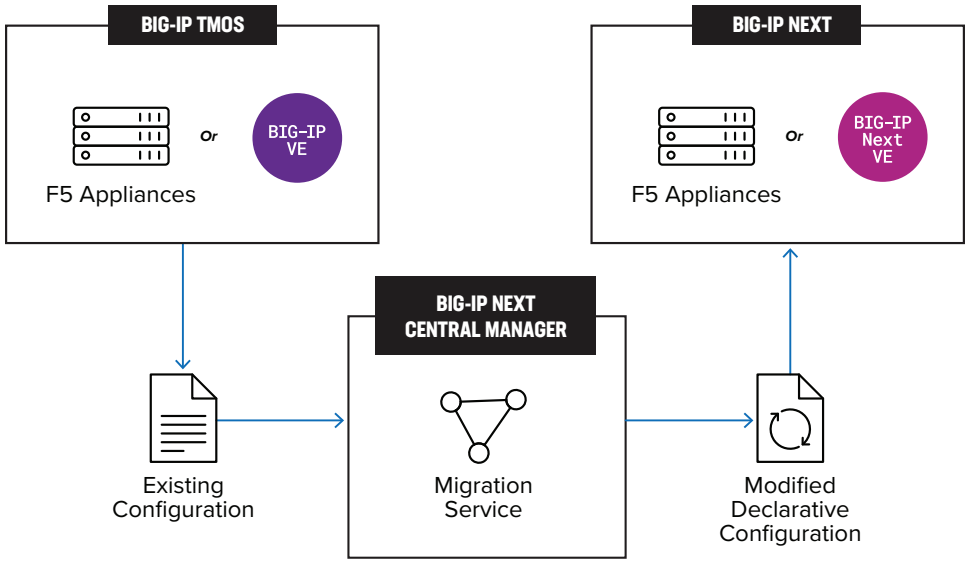


**Figure 4:** Process flow for BIG-IP TMOS to BIG-IP Next migrations using the Journeys Migration Service

Using the 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 or FAST declarations that replicate these configurations on BIG-IP Next. The Journeys Migration Service identifies any compatibility issues that might impact the deployment of the modified BIG-IP Next configuration and provides adjustment recommendations wherever possible. After deploying the modified configurations to BIG-IP Next instances, Journeys generates a post-deployment report providing assurance that the migration has been successful. This migration 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.

**If you're interested to learn more or try out F5's next generation BIG-IP software, please contact your F5 account manager or contact F5 sales today for more information.**