f5 + CISCO™

DevOps Innovation

Network Automation for
Continuous Application Delivery
and Deployment

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The Complexity of Managing Hybrid Networks

Today's users have high expectations for innovations in the technology products and services they consume. To meet these expectations, many enterprises adopt an application-first mindset that accelerates the pace at which they must deploy and update their products and services. DevOps is one of the leading methodologies for speeding up the delivery and performance of applications. Closely akin to the "agile" methodology, DevOps strives to align application development (the Dev) and IT operations (the Ops) to improve the entire application-management lifecycle.

In the fast-paced world of DevOps, the concepts of servers and storage in the data center are generally well served by virtualization and automation strategies. But two other key concepts—network and security—have been slower to realize the benefits of a software-defined approach. This makes sense, because servers are singular endpoints, but networks are complex, distributed entities with little or no homogeneity where changes to one element can significantly impact the entire infrastructure.

In addition, configuration and provisioning of the different aspects of the network have traditionally been managed in a siloed manner, with inefficient communication and poor collaboration among the network, security, development, and operations teams. In such environments, these manual processes can take days or even weeks, which undermines the agility that the DevOps methodology strives to deliver.

The most-heralded benefits of DevOps come from the Continuous Integration, Delivery, and Deployment (CI-CD) approach. CI-CD simplifies, automates, and accelerates application and services lifecycle management. But until now, network and security teams have not had the necessary tools to enable them to move with the same speed as the development and operations teams. To test the interaction of policies and services in these complex environments, enterprises need a new model for provisioning and management that will improve the time to market of new applications and keep pace with the agile DevOps lifecycle.

New Tools for CI-CD

Enterprises that embrace the CI-CD model of application development need to sustain rapid planning and deployment across development, operations, network, and security teams. Accordingly, testing of the network and application services infrastructure must happen concurrently with the application development and testing processes. The old, sequential approach of developing network configurations after the dev and test phases are complete simply cannot support the more agile CI-CD process.

The better solution is to take advantage of virtualization and programmability within the network and application services infrastructure. Rapidly evolving network orchestration and automation functionalities can now enable network and security teams to test policies and configurations before production, even in very complex environments. Automation of network services also helps ensure that when an application rolls out, the supporting infrastructure is ready to perform at the expected level.

Finally, when an application reaches the deployment stage, automation and orchestration of network and application services—enabled by validated templates and APIs—allow organizations to address performance issues quickly and easily. Applications can be fine-tuned through minor adjustments to policies, without completely reconfiguring the underlying infrastructure.

Innovations that help these network and security teams operate with speed and agility in a DevOps environment generally fall into two categories: network orchestration and application services automation.

Network Orchestration

Network orchestration tools leverage a software-defined infrastructure (SDI) approach to provision networks quickly and with minimal human error (similarly to how software-defined components like servers and storage are provisioned). These tools support flexible application provisioning across physical and virtual environments to improve overall network performance. In the CI-CD model, network orchestrators ensure that all production-critical application and network elements—availability, core network services, security services, and performance—are accounted for, and are rolled out in proper sequence.

Application Services Automation

Application services support application availability, performance, and security. This automation used to focus on simple load balancing—and load balancing is still critically important—but it now also includes a range of solutions such as OpenStack distributions that provide template-based programmability and APIs, which help network teams configure and automate application services during the test phase.

Network orchestration and application services automation toolsets are enabled by pre-built and -tested templates and APIs. Automation makes common tasks repeatable and scalable, greatly reducing the risk of human error and dramatically cutting the amount of time required to manage changes. This gives network and security teams consistency, predictability, repeatability, and efficiency in their deployments—and helps organizations realize the operational benefits of the CI-CD process.

Benefits of Applying DevOps Principles to the Network

The ability to program, test, and continuously deploy network and application services infrastructure concurrently with the rest of the application development process helps deliver on the promise of DevOps in the following ways:

Speed

In the dev and test phases of the CI-CD process, automation allows for faster configuration and deployment of network settings and policies. In the production phase, application performance can be tuned by making small adjustments to the existing policies without requiring wholesale changes to the underlying architecture. And it all can be completed in a fraction of the time deep configuration changes would require, transforming the process so tickets that may have taken weeks to resolve can now be closed in a matter of minutes.

Stability and Consistency

Automation ensures infrastructure stability across every application rollout and update. Validated templates preserve provisioning and configuration policies, making them readily available and easy to manage. There is no need to re-architect the entire network infrastructure during launch, nor throughout its lifecycle. Such capabilities significantly improve the efficiency, security, and availability of infrastructure resources throughout the application lifecycle.

F5 and Cisco: Bringing the Power of DevOps to the Network

For years now, F5 and Cisco have been collaborating on initiatives that redefine what is possible in network and services orchestration and automation. Through extensive joint investments and engineering, the two companies have developed groundbreaking innovations that advance current DevOps practices.

This collaboration has resulted in new levels of network automation and robust application services automation in one common, validated solution. In this way, F5 and Cisco bring DevOps principles to life for a growing number of global customers interested in embracing the agility that comes with CI-CD.

F5® BIG-IP® application delivery services provide robust security, improve performance, and ensure availability in both the data center and in the cloud. The Cisco Application Policy Infrastructure Controller (APIC) network orchestration tool provisions and configures these application services to secure and optimize applications at scale. BIG-IP integrates with Cisco APIC and F5 iWorkflow™ to automate deployment and configuration, ensuring policies follow their application services through application-level templates, REST APIs, and granular programmability. Together, these solutions ensure the entire DevOps team—including network and security—can deliver and deploy applications with the speed, reliability, and security necessary to meet today's business challenges.

In addition, F5 and Cisco support community-driven innovation by fostering a thriving ecosystem of DevOps professionals through F5's DevCentral and Cisco's DevNet. In these online communities and repositories, developers and operations professionals come together to share ideas, best practices, and code—all of which helps ensure successful application development and deployment. The communities also provide documentation, testing, sample code, and support to all users. Encompassing contributions from F5 and Cisco employees as well as countless other industry professionals, these communities offer a growing pool of resources to further accelerate the adoption of DevOps methodology among application, network, and security teams.

To learn more about how F5 and Cisco are partnering to foster collaboration and integration for faster application development and deployment, please visit f5.com/cisco or cisco.com/go/f5.