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How to Leverage Containers to Bolster Security and Performance While Moving to Google Cloud

BIG-IP enables the enterprise to efficiently address security and performance when migrating to the cloud.

Applications need services to ensure security and availability.

Despite the new capabilities, new business models, and step-change in speed that the public cloud has brought, one thing remains constant: Applications running in the cloud still need to be kept secure, fast, and available. Infinite scalability, unmatched flexibility, and reduced overhead make computing in the public cloud seem like the perfect IT solution that presents new challenges for managing app security and performance.

Complexity remains the biggest scourge of IT when it's moving apps to the cloud. Increased network segregation and inconsistent application services across hybrid cloud architectures place additional strain on IT departments while generating new security vulnerabilities.

Using the consistent services provided by a programmable, high-capacity application delivery controller continues to be the best way to bolster application security and performance. It also enables the deployment of complexity-busting tools such as containers, resulting in greater efficiency and scalability.

Ensuring consistency across platforms

As organizations increasingly run various enterprise applications in hybrid cloud and on-premises environments, the ability to use the same technologies and policies across multiple environments is crucial for ensuring operational efficiency and consistent application performance and protection.

This approach enables the enterprise to ensure consistency across platforms by leveraging the same services in Google Cloud that have been used for years in the data center. F5 BIG-IP Virtual Edition (VE) provides organizations with the ability to augment Google Cloud Platform (GCP) deployments to increase application security and performance when migrating to the cloud.

BIG-IP VE is a proven application delivery and security services platform that is built to ensure optimal performance, availability, and security of business-critical applications. It enables:

- **Intelligent L4–L7 load balancing and traffic management**
- **Robust network and web application firewall capabilities**
- **High availability**
- **Simplified application access**

Streamlined Deployment

Now fully integrated into the Google Cloud Engine, BIG-IP VE extends F5's application delivery capabilities beyond those of traditional data center perimeters. F5's BIG-IP VE images can be deployed directly from Google Cloud Launcher for use in cloud architecture. This enables organizations to get advanced application delivery and security services such as protocol gateways, application layer security, and tremendous analytics data for all applications running in Google Cloud.

Deploying applications in the cloud should always be a fast, effortless process. However, this is achievable only if the supporting application services can be fabricated in a similar fashion. With F5-generated Google Deployment templates, the latest versions of BIG-IP VE can be up and running in your Google network in a matter of minutes. Using templates located in F5's GitHub repository, everything from the deployment of essential cloud resources to the configuration of BIG-IP VE is performed autonomously in just a few clicks.

Feature Parity with Physical Platforms

Because the VEs are built on the same base code as BIG-IP hardware, they can offer the same enterprise-grade application delivery and security services as their physical counterparts. This enables you to take advantage of the scalability and flexibility of the public cloud without jeopardizing application performance and security.

Running BIG-IP VEs in GCP and taking advantage of F5's advanced L4–7 security services is the easiest and most effective way of ensuring that your applications are continuously

protected. Using BIG-IP Application Security Manager Virtual Edition (ASM VE) mitigates both application and protocol vulnerabilities and prevents L7 DDoS attacks while providing protection against OWASP top 10 application security threats. If you already have BIG-IP security modules elsewhere within your hybrid cloud infrastructure, it's straightforward to replicate the custom security policies you currently employ onto BIG-IP VEs in Google Cloud—ensuring consistent security across your architecture.

Cloud and Hybrid Cloud Implementations

Whether you decide to run your applications entirely in GCP or across a hybrid cloud architecture, F5 will protect your applications and data. F5's application services can also be quickly and easily replicated across data centers and all leading cloud environments—reducing rearchitecting time and costs if you ever need to relocate your application workloads.

According to Google solution architect Peter-Mark Verwoerd, "F5 BIG-IP VE is available and fully integrated and vetted with the Google Cloud Platform. The enterprise can leverage BIG-IP VE now to increase security and connect to container clusters to make it easier and faster to migrate to GCP. We've also made BIG-IP VE available on Google Cloud Launcher so organizations can swiftly deploy this solution according to best practices."

The process of migrating to GCP can be greatly simplified and accelerated with F5's application delivery services—dramatically increasing the security, performance, and availability of applications. F5 provides a single application services tier for use across hybrid cloud architectures, eliminating the need for multiple disparate solutions and the resulting IT strain. This deployment approach enables enterprises to seamlessly and confidently extend private data centers into the cloud and support consistent policies across hybrid cloud implementations.

Enabling dynamic container environments

According to 451 Research, software application container growth is exceeding 40% annually and is expected to be a $2.71 billion market by 2020.

Software container technology is becoming a central part of enterprise IT infrastructure, because it enables lightweight, fast code and run-anywhere execution environments that increase application portability and efficiency. But organizations still need tools to orchestrate the lifecycle of containers and manage critical functions such as security and availability.

Adoption of containerized environments is accelerating to facilitate faster app development—and these apps still need services, such as load balancing, SSL offload, performance enhancement, and security. Enterprise IT organizations are already familiar with providing these capabilities for on-premises applications, so the ability to implement these services by using a consistent set of tools enhances the implementation and operation of cloud-based applications.

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> **Peter-Mark Verwoerd** Head of Migration Architecture, Google

F5 Container Connector enables self-service app performance and security services within orchestration environments, by integrating BIG-IP with container environments. It enables services to be delivered in dynamic container environments by coupling F5 configuration with container events. Container Connecter simplifies policy management, resulting in faster app deployments. IT can easily configure application delivery and security services with predefined BIG-IP templates.

Integration with Kubernetes

Google has been running production workloads in containers for more than 15 years, and the Google Kubernetes Engine is a managed environment for deploying containerized applications, incorporating Google's latest innovations in developer productivity, resource efficiency, automated operations, and open source flexibility to help organizations accelerate cloud migration.

F5 Container Connector easily integrates F5 BIG-IP VE with native container environment management and orchestration systems such as Kubernetes. It enables organizations to deploy self-service ingress control and service mesh within container orchestration service scheduling. Container Connecter simplifies policy management, resulting in faster app deployments. You can easily configure app delivery and security services with predefined BIG-IP templates and link services to containers simply by attaching metadata labels to the Kubernetes objects.

Container Connector is integrated with Kubernetes and monitors the Kubernetes API to discover new objectives and add them to the application delivery configuration. Container Connectors provide the ability to automatically provision and manage the app services required for containerized apps in a production environment, without requiring massive overhauls to the environment that already existed in development and test.

"By subscribing to events from Kubernetes, the Container Connector dynamically creates, modifies, or removes configurations on BIG-IP," says F5 solutions architect Robert Haynes. "This provides the enterprise with advanced security, optimization, and monitoring functions delivered seamlessly as your container-based services shrink and grow. Your production applications can get the protection, acceleration, and visibility you need with the agile, scalable architecture that IT demands."

Application Agility

When it comes to application deployment, agility is king. Businesses need to move quickly, and public cloud infrastructure offers the flexibility and scalability they need in order to stay competitive. However, the same security and compliance issues affecting traditional data centers are still very real concerns with cloud deployments. Public cloud providers guarantee infrastructure security, but application owners are responsible for the security of their applications and data.

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With F5 Container Connector for Kubernetes, you can manage traffic going to new containers as the cluster manager brings them online. This process is integrated and occurs automatically, which means consistent application of security policies without further complication of the containerized environment.

It also simplifies the use of SSL/TLS to secure traffic by providing a single point at which to manage and maintain certificates. This keeps the containerized environment free of additional operational complexity, a common complaint when containers and their associated application architectures are introduced.

Familiar Tools and Technologies

"The integration of F5 solutions with GCP enables IT to leverage familiar tools and technologies to make sure that applications will be protected and available as they move to

the cloud," explains Haynes. "This enables the enterprise to simplify container migration and reduce its risks, providing confidence to IT organizations as they move applications to GCP."

"Many organizations evaluating cloud solutions already deploy F5 solutions for ensuring the performance and security of their premises-based applications, so the deployment of BIG-IP VE and F5 Container Connector provides both familiarity and consistency to IT organizations migrating to GCP," says Google strategic alliance manager Asad Baheri.

He continues, "Balancing application traffic and security is a common need for companies migrating to cloud environments, and this approach enables IT to opt for a proven solution that it's probably already familiar with that is already verified on GCP. Organizations can optimize cloud migration by minimizing the time and effort of moving to the cloud while maintaining the services that applications require."

Streamline Google Cloud migration with F5 solutions

The enterprise can now migrate applications to Google infrastructure, leverage containers and Kubernetes, and still have the required enterprise-grade protection and availability—even in dynamic environments. GCP adoption continues to grow rapidly, and organizations can more confidently migrate apps to Google Cloud by deploying BIG-IP VEs and F5 Container Connector for Kubernetes.

Running BIG-IP VEs in your GCP environment and taking advantage of F5's advanced L4–7 security services is the most effective way of ensuring that your applications and networks are continuously protected against application-layer threats and attacks.

The ability to replicate applications throughout multiple geographic regions empowers application owners to reduce redundancy and accelerate performance. By using global server load balancing to make informed routing decisions based on either the physical proximity of a server or the real-time performance or health of a server, IT can ensure an optimized user application experience—regardless of the user's location.

"Organizations can now capitalize on the advantages of deploying dynamically created and deployed container services while leveraging the consistency, security, and performance of BIG-IP services," Haynes states. "Many organizations turn to GCP for its promise of digital transformation enabled by automation, and F5 solutions enable the security and availability needed to help deliver on strategic digital transformation objectives."

F5 Container Connector for Kubernetes enables the enterprise to ensure that container-based applications can be protected and scaled. It makes self-service app performance and security services possible within your orchestration environment, by integrating BIG-IP VE with your Google Cloud container environment.

By augmenting Google Cloud migration with solutions from F5, the enterprise can bolster application security and performance while accelerating the many benefits of cloud migration. F5 accelerates the move to GCP while minimizing risks and ensuring performance and security. Bringing F5 application delivery services to GCP enables you to leverage the people, skills, and tools you rely on in your data center to ensure the security, availability, and performance of your cloud-based applications.