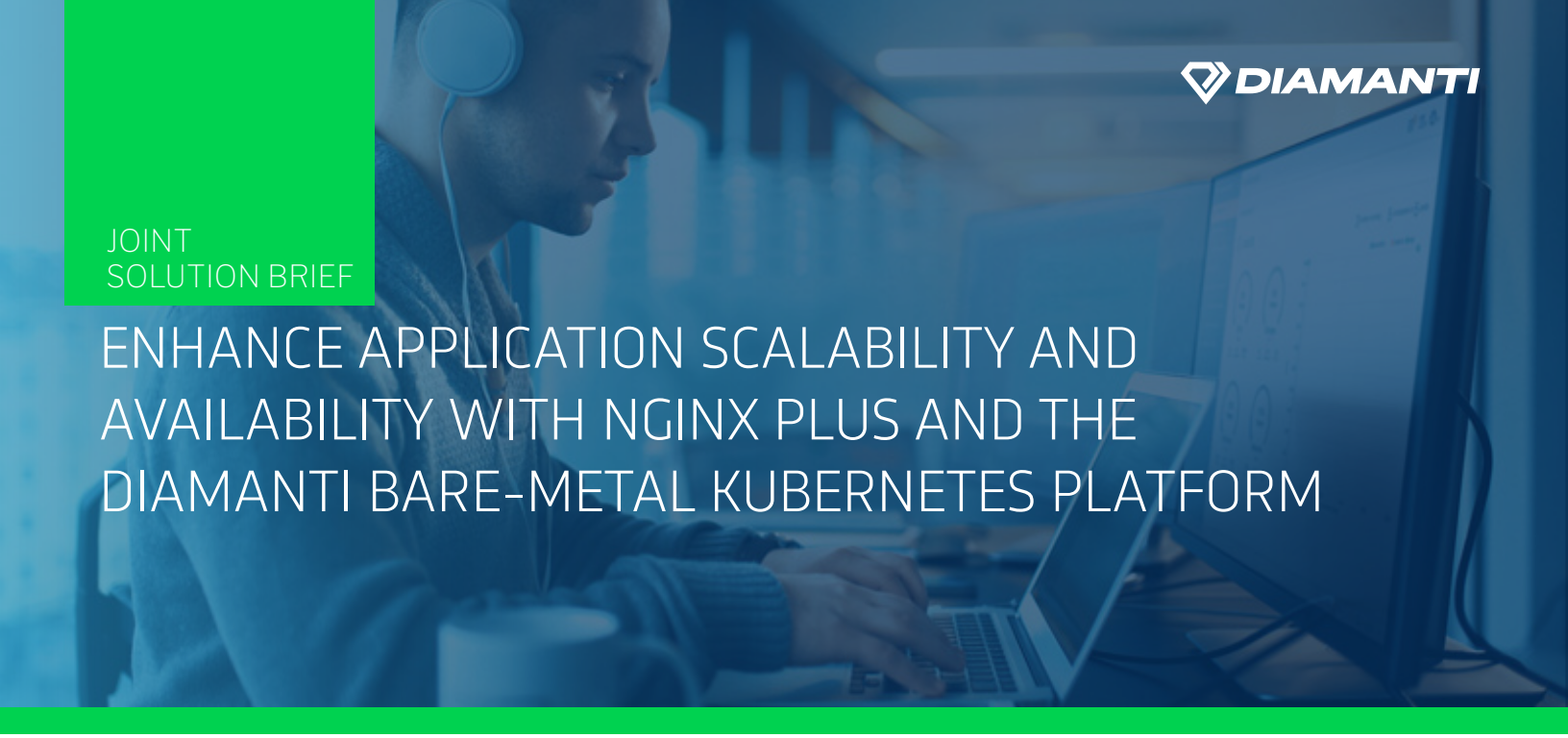

JOINT
SOLUTION BRIEF

ENHANCE APPLICATION SCALABILITY AND AVAILABILITY WITH NGINX PLUS AND THE DIAMANTI BARE-METAL KUBERNETES PLATFORM

Modern load balancers which deploy as a set of microservices can be updated and scaled in lock-step with the applications they service. The flexibility inherent to software load balancing means that both developers and operations personnel can make changes on the fly—without relying on other teams.

As enterprises seeking to deploy applications on Kubernetes explore flexible, container-native load balancing architectures that enhance application scalability and availability, they face major challenges with network configuration, application-level Quality-of-Service (QoS), and infrastructure high availability (HA).

Container network configuration within Kubernetes is complex and time-consuming, and when the underlying container stack is composed of legacy infrastructure, maintaining service level guarantees for applications is impossible without over-provisioning resources. Establishing high availability and avoiding application downtime is the most significant challenge, and depends on two primary factors: flexible load balancing architecture that can effectively mitigate outages, and the ability for the underlying infrastructure stack to support a distributed Kubernetes cluster with guaranteed performance, as multi-zone cluster stability is highly sensitive to network and storage I/O.

Diamanti is
Kubernetes 1.10 certified

DIAMANTI PLATFORM AT A GLANCE

SPEED

- Container infrastructure deploys in 15 minutes
- 2.4M+ IOPS per three-node cluster
- 200µs latency across the cluster

SIMPLICITY

- Plug-and-play cluster deployment and easy management
- Self-service networking, storage, and capacity scaling with only a few clicks
- RBAC and Active Directory integration

EFFICIENCY

- 50% smaller infrastructure footprint
- 70% lower TCO compared to public cloud deployments
- 90% utilization using existing networks and software
- Integrates easily with established workflows

CONTROL

- Container-granular policies and monitoring
- Guaranteed SLAs
- Network and storage QoS
- No vendor lock-in
- 24x7 full-stack support

DIAMANTI AND NGINX: DELIVERING PRODUCTION-GRADE, HIGH PERFORMANCE LOAD BALANCING FOR KUBERNETES INFRASTRUCTURE AND APPLICATIONS

Together, Diamanti and NGINX speed the deployment and configuration of containerized applications on Kubernetes-based infrastructure. In conjunction with the Diamanti bare-metal container platform, which enhances availability through easily configurable, stable multi-zone clustering, the NGINX Ingress controller and NGINX Plus software load balancer ensure that applications are delivered reliably, securely and can automatically scale.

DEPLOY CONTAINERS ON A MULTI-ZONE KUBERNETES CLUSTER WITH DIAMANTI IN MINUTES

The Diamanti bare-metal container platform provides enterprises with turnkey operational infrastructure using standard virtualization protocols for storage and networking alongside open-source plug-ins: CNI and FlexVolume.

Each Diamanti cluster pools low-latency, high-performance NVMe flash storage and 40GbE networking, and comes with open-source Docker and Kubernetes pre-installed. On the Diamanti platform, containers can be deployed minutes after racking and stacking the Diamanti cluster, where each pod is assigned a routable IP address due to Diamanti's innovative approach to network virtualization for containers.

Implementation of multi-zone clusters on the Diamanti platform allows a Kubernetes cluster to distribute nodes across different zones, ensuring application and infrastructure availability. Diamanti simplifies multi-zone cluster configuration and management with built-in capabilities to protect applications from failures.

NGINX PLUS AT A GLANCE

ENTERPRISE-GRADE INGRESS CONTROLLER FEATURES

- Support for session persistence, WebSocket, HTTP/2, and gRPC addresses the needs of complex microservices applications.
- Ability to export metrics to Prometheus
- Extended Helm charts for supporting additional Ingress Controller parameters
- Support for health checks and mergeable configurations for making multi-tenant services easier and more scalable

EXTENDS TRADITIONAL LOAD BALANCING WITH SOFTWARE

- HTTP, TCP, and UDP load balancing
- Layer 7 request routing using URI, cookie, args, and more
- Session persistence based on cookies
- Active health checks on status code and response body
- Service discovery using DNS

SECURE

- SSL/TLS termination with configurable encryption and support for JWT authentication maximizes performance and privacy

REDUCED COMPLEXITY

- Standardizing on NGINX Plus means fewer tools to manage, and that means more reliable applications and lower costs

COST EFFECTIVE

- Save more than 80% compared to hardware ADCs, without sacrificing performance or functionality

PROVISION NGINX PLUS ON KUBERNETES WITH DIAMANTI

While Kubernetes offers a basic load-balancing framework for HTTP traffic (simply called Ingress), a dedicated ingress controller will be required to utilize the basic framework to provide load balancing capabilities for applications. NGINX Plus delivers a comprehensive set of features across ingress control and load balancing that are instrumental for automated configuration, application scaling, and maintaining high availability.

With the Diamanti platform configured and running, Helm Package Manager can be used to rapidly deploy NGINX Ingress controller across Kubernetes clusters with ease. Users benefit from real-time monitoring and ingress statistics via the NGINX Plus dashboard and Prometheus, rich application delivery capabilities such as session persistence and client authentication, multi-tenant configuration, and system stability throughout on-the-fly configuration changes.

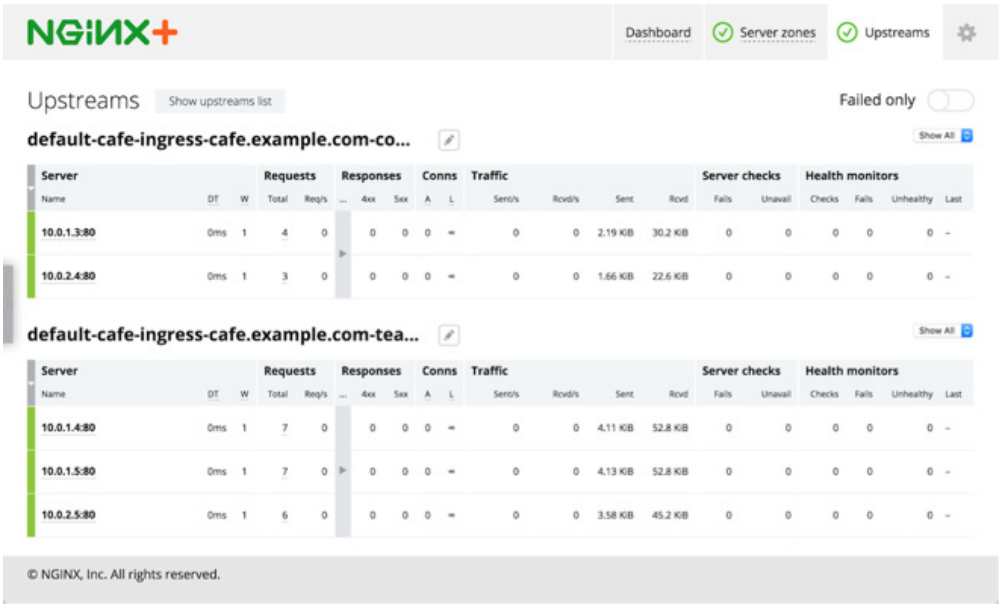

FIGURE 1: NGINX offers detailed monitoring and ingress stats

For Diamanti clusters, common load-balancing configurations that leverage the NGINX Plus Ingress controller include cluster-level (a single load balancer serves the entire cluster), zone-level (a single load balancer serves each individual zone in the cluster) and node-level (a single load balancer serves each node in the cluster).

Modern load balancing architectures follow microservices-based application deployment and scaling approaches, where ingress controllers are set up for individual applications, or sets of services that work together.

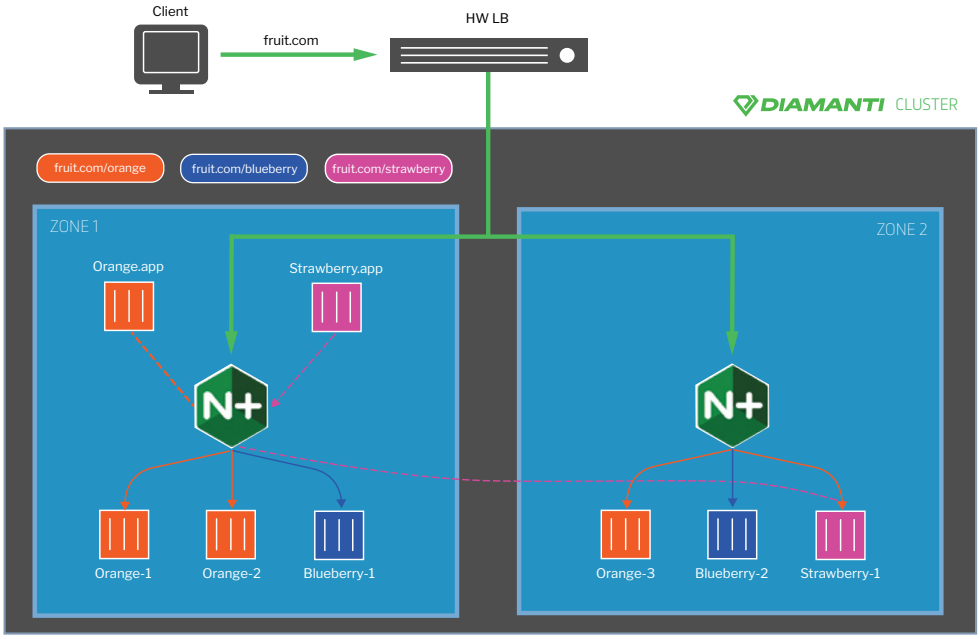

FIGURE 2: Zone-level NGINX Ingress controller deployment on Diamanti

For even greater flexibility, the NGINX load balancer can be set up as a service mesh, where each Ingress controller runs as a side car so that each pod is fully capable of doing its own client-side load balancing.

The fabric model offers significant advantages:

- Enables East-West load balancing
- Minimizes hops and latency
- Enables secure communication between pods using TLS, without requiring modification of applications
- Built-in health monitoring and cluster-wide visibility
- Built-in HA for east-west load balancing. That way, when one service pod goes down, client pods can still access the other service pods

SUMMARY

Diamanti and NGINX Plus combine to substantially improve application and Kubernetes infrastructure resiliency for enterprises seeking to minimize risk of downtime. The Diamanti platform gives enterprises high-performing production Kubernetes environments that can easily be configured in multi-zone clusters for enhanced availability. Partnering with NGINX further enhances Kubernetes resilience through the application of highly-dynamic, modern load balancing architectures using NGINX Plus Ingress controller and load balancer.

ABOUT DIAMANTI

Diamanti's bare-metal container platform gives infrastructure architects, IT operations, and application owners the speed, simplicity, efficiency, and control they need to run stateful containerized applications at scale. With open-source Docker and Kubernetes fully integrated, together with purpose-built hardware and complete support for the entire stack, the Diamanti platform is a proven full container stack that deploys in minutes.

ABOUT NGINX

NGINX is the heart of the modern web, powering half of the world's busiest sites and applications. The company's comprehensive application delivery platform combines load balancing, content caching, web serving, security controls, and monitoring in one easy-to-use software package.