Accelerate Time to Value for Your Applications and Infrastructure

Solution Brief
March 2017

With Cisco UCS and Docker Datacenter

Highlights

Support for Microservices Architecture

- Containers and microservices are the building blocks of today's applications.

Cisco UCS with Docker Datacenter

- Our network is the backbone of the solution, providing high availability and consistent low latency regardless of where your containers reside.
- Server and network deployment is automated, accelerating time to value by eliminating time-consuming, error-prone, manual processes.

Reduced Cost and Risk

- Deploy with the guidance of Cisco Validated Designs, which give you a blueprint for deploying our solution.

Cisco® and Docker solutions pave the way for continuous application integration and delivery.

The fast pace of today's software development and application deployment methodologies strains traditional processes. To keep business moving as quickly as your developers and DevOps processes, you need a more lightweight approach. Containers and microservices are being adopted as the building blocks of today's software, whether deployed locally or in the cloud. But when your business is at stake, not just any container solution will do. Cisco Unified Computing System™ (Cisco UCS®) with Docker Datacenter delivers an enterprise-ready solution for continuous delivery of applications and services.

Create and Deploy Anywhere with Docker Solutions

Docker solutions use an innovative microservices architecture that allows your DevOps teams to quickly and continuously integrate and deliver new and existing enterprise applications. The code, runtime environments, system tools, libraries, and system resources are distributed in self-contained, independent deployment units that are portable across virtualized and private and public cloud infrastructure. Docker Datacenter provides container orchestration, application management, and enterprise-class security for continuous integration. Your developers own the code, from the infrastructure to the application, and can quickly move from build to production environments. As a result, you can rapidly create, distribute, deploy, and run your applications anywhere and have confidence that they will perform as expected.

The Advantages of Cisco UCS with Docker Datacenter

Containerized applications and services introduce a new challenge for operations. All requests to and between microservices hosted in containers must traverse a network interface—even if they are local. This requirement makes the network

a critical resource. In traditional environments, networks are manually deployed, network interfaces are manually configured, and latency is variable depending on where the two communicating services reside. All these factors undermine performance and reliability and confidence that the system can support business-critical applications with consistent levels of service.

A Better Approach

With Cisco UCS, we take a different approach. We tightly integrate the network as the backbone of a system, tying together blade and rack servers with low, consistent latency regardless of where in the system your software is hosted. We link software to the fabric through virtual network interfaces that are automatically programmed on demand to meet the needs of your software with no error-prone, manual processes or human intervention required. We build in reliability and performance with a dual active-active unified fabric and automated failover that can be configured to support from 20 to 80 Gbps of network bandwidth per blade or rack server. Not only is the network configuration automated, so is the very identity, connectivity, and configuration of each of your servers. The infrastructure is fully programmable and automated through a unified control plane accessible through a GUI or an open and fully documented API. These features make initial deployment and future scaling straightforward. You don't have to worry that network topology or server configuration drift will affect the services you need to deliver. The result is an enterprise-class solution that your development and operations teams can deploy and use to support infrastructure resources and applications in less time.

Reduce Risk and Deploy Quickly with Cisco Validated Designs

The Cisco Validated Design for Docker Datacenter on Cisco UCS describes how to deploy Docker Datacenter and Docker Engines running on Red Hat Enterprise Linux on Cisco UCS B-Series Blade Servers and C-Series Rack Servers with your choice of storage from our enterprise partners. These components tie your infrastructure to applications across containers and physical elements for better management, visibility, and security. With Docker Datacenter on our integrated infrastructure solutions, you have automation and orchestration that manages your container lifecycle, and automated infrastructure management that supports the underlying infrastructure.

Share and Move Resources

Running multiple application components on a server is one of the best ways to control costs. Docker containers provide a safe and secure way for you to host multiple applications and tenants without concern that one will consume all available resources. If you need to move an application, you can simply move its container to a different segment of your Cisco UCS infrastructure. Data remains available, because Docker volumes are accessible across multiple hosts and volumes can be easily exported and later imported. You also can clone volumes when additional data access, integrity, or recovery operations are needed.

Help Ensure Application Performance

You need assurance that your shared infrastructure resources won't be a bottleneck. With Cisco UCS, production network traffic uses a dedicated interface created on a Cisco UCS virtual interface card (VIC). If a failure occurs, this interface automatically fails over from the primary to a secondary unified fabric connection (Figure 1). Container file system traffic uses a bonded pair of network interfaces, each connected to both system fabrics. Each container or group of containers is isolated through a dedicated virtual LAN (VLAN). Automated network optimization helps ensure that the network delivers well-defined and predictable service, including security through network segmentation, quality-of-service (QoS) policies, and network characteristics such as lossless Ethernet and jumbo-frame support.

Scale on Demand

Cisco UCS and its automated deployment gives you the freedom to standardize, secure, and scale the underlying environment so that your teams can quickly respond to dynamically changing requirements. You can purchase the systems you need today and scale your integrated infrastructure up or out for greater performance and capacity. You can scale without disruption by adding or upgrading components without adjusting your software or your networking capabilities or interrupting operations. Built-in management tools detect new components and automatically configure new servers, making the process fast and error-free.

Trust a Proven Architecture

You need assurance that the components you purchase will integrate and perform as expected. To help, we verify and test solutions in our labs and develop Cisco Validated Designs as guidebooks for implementation. These validated designs help reduce risk and guesswork. By following our

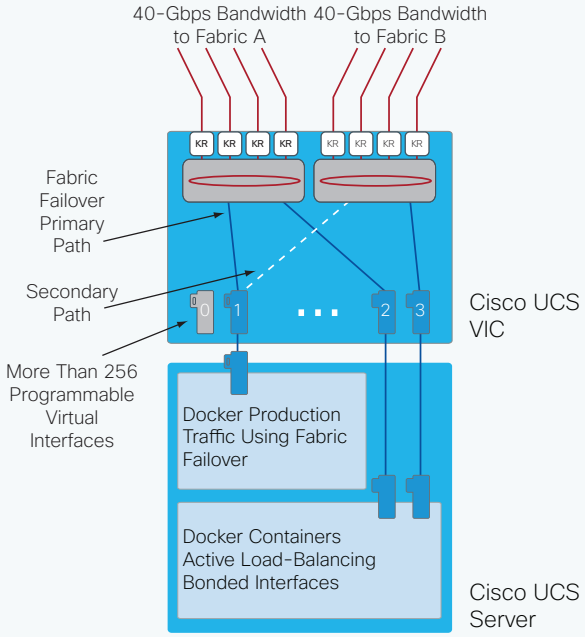

Figure 1 Cisco UCS VICs Reduce Production Traffic Bottlenecks and Automatically Fail Over to Support Continuous Operation

guidelines, you can easily move to a Docker container-based approach and continuously develop, deploy, and operate applications.

Adopt Containers with Confidence with Docker Datacenter on FlexPod

Another in a series of container-related solutions, the FlexPod Datacenter with Docker Datacenter for Container Management is a Cisco Validated Design that can get you started on your journey to application delivery modernization. In this guidebook, you learn how to deploy Docker containers and Docker Datacenter on FlexPod solutions engineered on Cisco UCS. This agile and flexible solution offers additional capabilities, including hassle-free storage management.

Using the NetApp Docker Volume Plugin provided with the solution, your developers and IT staff can access the best NetApp storage for the job. This open-source plug-in supports all NetApp primary storage platforms, including Data ONTAP, SolidFire, and E-Series storage, all at the same time, providing persistent storage for containers using the Network File System (NFS). Your DevOps teams can easily deploy multiple simultaneous application instances that use different storage configurations, including customized volume properties and tailored storage solutions that accelerate performance, without having to learn detailed storage management commands and processes. Just use the well-documented Docker API, and the plug-in handles the details of storage management.

For More Information

- For more information about containers on Cisco UCS, visit http://www.cisco.com/go/ucscontainers.
- For more information about Docker Datacenter on Cisco UCS, read the Cisco Validated Design.
- For more information about FlexPod with Docker Datacenter for Container Management, read the Cisco Validated Design.
- For more information about Cisco UCS, visit http://www.cisco.com/go/ucs.

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