Executive summary

A single Dell EMC PowerEdge R750 using Kubernetes containers supported up to 47,150 web application users across 11 instances

With a VMware vSphere and VMware Tanzu Kubernetes Grid environment, the server supported thousands of Weathervane users while meeting quality of service (QoS) requirements

Supported up to

47,150

Weathervane users

Kubernetes containerized environments can allow organizations to offer a high-quality user experience for multi-tiered web applications, such as those for online auctions and ecommerce.

In our data center, we tested a Dell EMC™ PowerEdge™ R750 server running VMware® vSphere® and VMware Tanzu Kubernetes Grid (TKG) using Weathervane 2.1, a multi-tiered web app workload for Kubernetes. We found that the server supported up to 47,150 concurrent Weathervane users (WvUsers) while meeting the workload's quality of service (QoS) requirements. With this kind of performance, the PowerEdge R750 running a VMware Kubernetes environment could allow organizations to consolidate application tiers from older servers and continue to meet critical service level agreements.

18
Tanzu Kubernetes Grid application cluster worker-node VMs

47,150
Weathervane users

11
Weathervane instances

About Kubernetes containers

A container is a unit of software packaged with everything required to run that software in a standalone state. Containers comprise everything an application needs to run, including binaries, libraries, dependencies, and of course, the application itself. Kubernetes is an open-source platform for deploying and managing applications that run in containerized environments.

Our testing

To see how well the PowerEdge R750 could handle a VMware Kubernetes environment for a multi-tiered web app, we used Weathervane, which simulates an online auction site where thousands of users view products and information on items for sale and then place bids. We ran tests to determine the maximum WvUsers that the benchmark could simulate across multiple Weathervane instances simultaneously on a single TKG cluster—all while meeting QoS requirements for response times, operation mix, and failure percentage.

Similar to the way an IT administrator might determine the optimal configuration for hosting a multi-tiered web app on a comparable PowerEdge R750 single-host TKG cluster, we ran many quantities of TKG worker-node VMs and concurrent Weathervane instances. We used Weathervane's findMaxSingleRun run strategy parameter to find the maximum user count. After trying different combinations of users and number of instances, we determined that the PowerEdge R750 could support 47,150 WvUsers across 11 app instances running in 18 app-cluster worker nodes while meeting QoS requirements.

For companies that run sites like Weathervane's auction environment, supporting a high volume of users is vital to offering a positive user experience and yielding a high return. Our results indicate that with a single Dell EMC PowerEdge R750 running multiple app instances and supporting thousands of users, companies could seek to expand their business with a modest investment, or they could investigate web app workload consolidation—thus allowing older servers to support other workloads or application development. For other kinds of multi-tiered web apps, such as those for ecommerce, organizations could potentially support more users or generate more revenue with the PowerEdge R750 and a VMware Kubernetes environment.

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