Cisco IT Insights

# Cloud-Ready Java Virtual Machines

What

Cisco IT has migrated more than 100 Java Virtual Machines (JVMs) used for large-scale, customer-facing applications to our internal Lightweight Application Environment (LAE). Previously supported on an IBM WebSphere platform, these JVMs host applications and web services for essential company activities such as operating the Cisco.com website, managing customer support cases, running our global supply chain, and maintaining customer service delivery tools for the Cisco® Advanced Services group.

LAE provides a flexible platform-as-a-service (PaaS) environment for developing and managing applications on Cisco Unified Computing System™ (Cisco UCS®) servers. In late 2016, this environment will be supported on our Cisco Application Centric Infrastructure (Cisco ACI™), which is based on Cisco Nexus® 9000 Series Switches.

"LAE gives us more capabilities throughout the application lifecycle stages of development, staging, load testing, and production deployment," says Sumanta Mandal, IT project manager, Cisco IT. "Although today we primarily use Java for application development, LAE gives us the flexibility to adopt other development languages in the future including PHP, Python, Ruby, and Perl."

Another valuable LAE feature is the ability to support "blue-green" production deployment for an application. In this process, the development team configures two identical production environments: blue for the application while it is in development and green for the live production deployment. The application is developed and tested in the blue environment and when it is ready, that environment is designated as green and put into the production release process. If an unexpected problem occurs, the change can be reversed immediately. If the change is successful, the environment previously designated as green can be decommissioned or used for another purpose (Figure 1).

Figure 1.   Blue-Green Environment Design
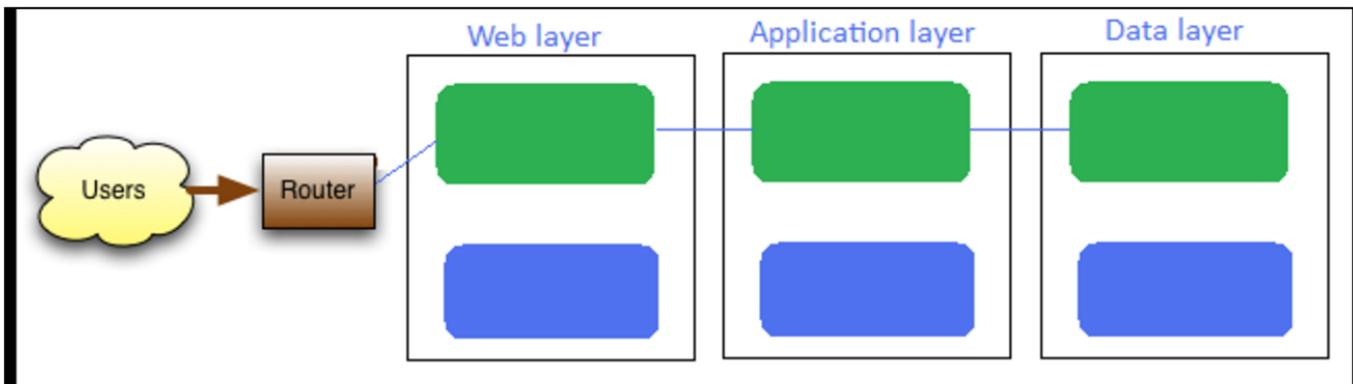
To date, applications on migrated JVMs did not experience a reduction in performance levels after the move to LAE. We expect to see similar results as we migrate the JVMs for other Cisco IT applications to this environment.

    August 2016

Why

Migrating application JVMs to LAE helps us realize several benefits.

Cost savings. The ability to use open-source technology for developing applications and the JVM infrastructure reduces our platform licensing costs. We also reduce expenses through high-density utilization of the Cisco UCS servers and the ability to dynamically scale them as needed instead of over-provisioning servers to be ready for peak traffic loads.

Time savings. The blue-green deployment design means we can release a new application version in a few minutes, compared to a traditional downtime window of 4 to 6 hours. This time reduction also allows applications to be released on weekdays instead of only on weekends.

Agile development capabilities. LAE aligns with Cisco IT initiatives for IT delivery transformation and software development as a service (SDaaS) by offering complete lifecycle management for applications. Our application development processes benefit from a flexible choice of open-source tools and easy integration with web services at the enterprise level. The environment also offers multiple, API-driven client interfaces to interact with applications.

Infrastructure scalability and flexibility. LAE supports an adaptive infrastructure that allows dynamic scaling of applications based on workload. Obtaining more JVMs no longer requires a manual process. Instead, LAE can allocate additional JVMs as needed.

Foundation for the future. As a cloud-native platform, LAE will allow us to package applications as payloads that can move between a physical Cisco data center and the cloud. LAE is also aligned with the Cisco IT roadmaps for future work in IT delivery transformation, ACI, and OpenStack.

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August 2016