

Moving an on-premises IBM WebSphere application to the cloud

Our comparison of the time and costs of IBM Bluemix and Amazon Web Services



Highlights from our comparison

- **Learn fast:** 15 times faster when deploying IBM WebSphere Application Server on IBM Bluemix compared with Amazon Web Services (AWS)
 - **Deploy quickly:** 3.5 times shorter deployment time using Bluemix as compared to AWS
 - **Control costs:** 4 times lower operational costs with Bluemix as compared to AWS
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Many organizations are eager to capitalize on the flexibility, scalability and cost-saving potential of public cloud services. But before selecting a cloud service and beginning to move enterprise applications to a new environment, your organization must evaluate the potential time and costs involved.

To help your organization make the best decisions, our IBM team decided to measure the learning and deployment time for moving an on-premises web application to a public cloud, and to assess the operational costs for running that application in the cloud. An experienced IBM® WebSphere® Application Server (WAS) administrator compared two public cloud environments: WAS on the IBM Bluemix® platform and WAS on Amazon Web Services (AWS) using MidVision WAS Amazon Machine Images (AMIs). The IBM administrator evaluated a scenario in which an application previously deployed in an on-premises WAS Network Deployment (WAS ND) environment was moved to an off-premises WAS ND environment in the cloud (Figure 1).

Building out a topology for two cloud environments

The IBM administrator—who had experience deploying WAS ND environments on premises—was tasked with building out a WAS ND V9.0 topology for both cloud environments. The goal was to measure and compare metrics for learning time, deployment time and monthly operational costs. The on-premises data center box in Figure 1 shows the WAS ND configuration. That configuration was used as the blueprint to deploy an identical environment in the cloud.



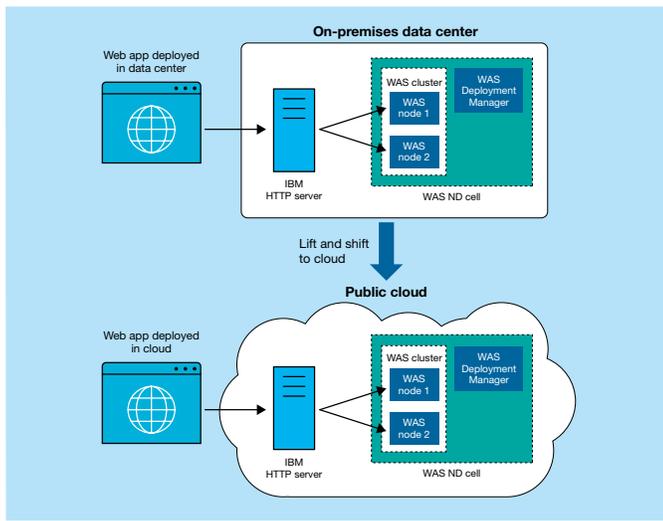


Figure 1. IBM examined the time and costs of running an enterprise web application in a public cloud environment.

For each cloud deployment, the IBM administrator performed the following steps:

1. Deployed WAS ND components for a two-node WAS cluster, including:
 - a. WAS Deployment Manager
 - b. WAS Application Server node 1
 - c. WAS Application Server node 2
 - d. IBM HTTP Server (IHS)
2. Created a WAS cluster across the two WAS nodes
3. Deployed a web application on the WAS cluster
4. Configured an IHS (Load Balancer) to spray requests to the WAS cluster
5. Accessed the deployed web application through the IHS from a browser

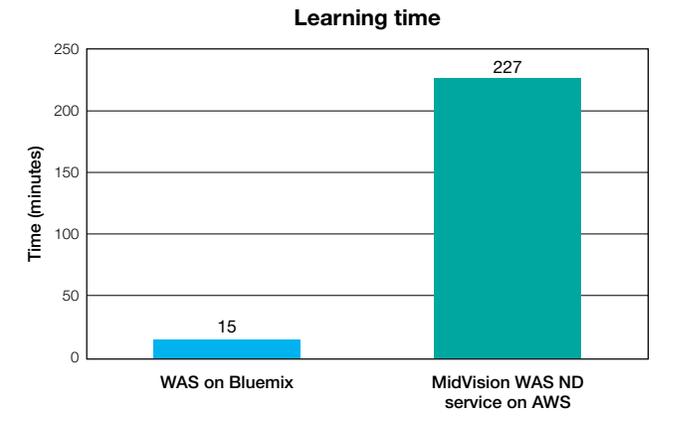


Figure 2. Learning time was significantly lower for the Bluemix environment.

Minimizing learning time

To evaluate learning time, the IBM administrator measured the time required to understand navigation, prerequisite provisioning and configuration, software deployment steps and configuration methodology for each cloud vendor’s service. Although the learning process involved some hands-on investigation, the IBM administrator delineated the end of the learning period as the moment when the IBM administrator was ready to begin the actual WAS ND deployment.

IBM’s analysis showed that the learning time for the IBM administrator to deploy WAS ND on AWS with third-party AMIs was 15 times greater than for WAS on Bluemix (Figure 2). This learning time for AWS and Bluemix would be incurred only once if an organization were to move an enterprise web application to a public cloud environment. Any subsequent deployments of WAS ND applications in the cloud would not incur that learning time. Nevertheless, in our evaluation, selecting Bluemix was able to free up several hours of administration time for other tasks.

There are several factors that might have contributed to the IBM administrator’s shorter learning time with Bluemix. For example, the Bluemix portal is designed to be intuitive and provides clear documentation with step-by-step instructions on how to use the WebSphere service. The IBM administrator was able to follow the instructions and deploy a WAS ND environment without any prior Bluemix skills.

By contrast, we found that deploying a WAS ND environment with AWS was time-consuming to learn without prior AWS skills. Those challenges might have been due in part to the way the WAS ND environment is deployed in AWS. For example, the IBM administrator had to learn the various proprietary security concepts, such as security groups, that are required for successful, secure communication among virtual machines (VMs).

In addition, AWS did not provide DNS resolution for host names, and the host names of the VMs changed after each restart. As a result, the IBM administrator needed to understand how to use internal IP addresses for all VMs in the WAS ND environment to ensure proper network communication exists between the VMs in the environment.

AWS documentation presented another challenge for the learning process. Although an abundance of documentation was available, the IBM administrator found the documentation to be dispersed among several online locations, requiring him to spend time searching for and collecting information on each specific issue.

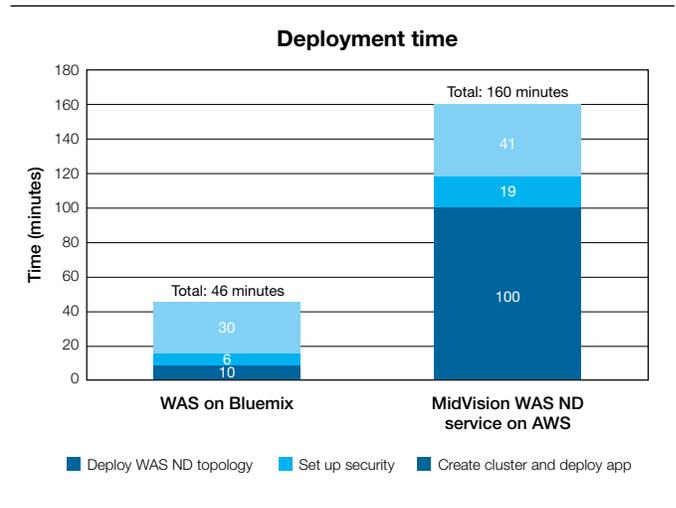


Figure 3. Deploying the application on AWS took significantly more time than on Bluemix.

Accelerating deployment

When organizations make the decision to move an enterprise application to the cloud, they want to complete the deployment quickly. A fast deployment enables organizations to capitalize on cloud benefits right away and minimize any potential downtime—and allows IT administrators to get back to other projects sooner.

In our analysis, deploying the web application to WAS in Bluemix was approximately 3.5 times faster than with AWS (Figure 3).

Why was the IBM administrator able to deploy WAS ND on Bluemix significantly faster than on AWS using third-party AMIs? First, with AWS, the administrator needed to conduct several manual tasks to build the VMs and ensure the VMs in the WAS ND environment could communicate internally. These tasks required deep AWS expertise, involving a significant learning curve. With Bluemix, internal communication between the VMs was handled automatically during the deployment of the WAS ND environment.

Second, with AWS, the IBM administrator had to manually deploy and configure each of the four VMs in the WAS ND topology separately, which consumed a substantial amount of time. With Bluemix, the administrator deployed and configured all four VMs in the WAS ND environment simultaneously by clicking one “Provision” button.

Finally, in AWS, the MidVision AMIs did not offer an IHS AMI. As a result, the IBM administrator had to manually deploy it in a separate VM and configure it into the WAS ND environment. With Bluemix, the IHS component was automatically deployed and configured with the rest of the WAS ND environment.

Controlling monthly operational costs

Moving an enterprise application to a public cloud environment can offer significant cost savings compared with running the same application in-house. Organizations can repurpose or retire infrastructure, and if they take systems out of service, they also eliminate the associated power, heating and cooling expenses for those systems.

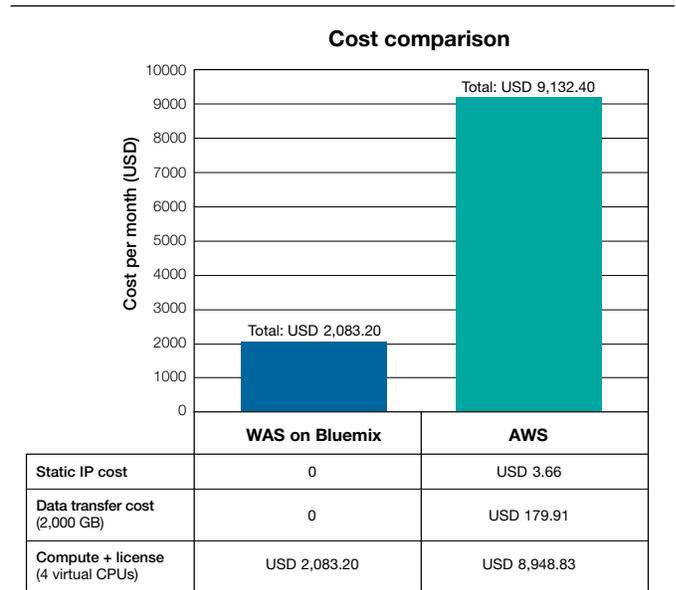


Figure 4. Running a web application on Bluemix was less expensive than running the same application on AWS.

However, not all public cloud environments are priced the same. Selecting the right service is critical for maximizing the cost-savings benefits of the cloud.

In our analysis, the costs to run a web application on Bluemix were estimated to be more than four times lower than the costs to run the same application on AWS using third-party AMIs (Figure 4).¹

Several factors contributed to this difference in costs between running a web application on Bluemix and running the same application on AWS. First, the WAS ND licensing and infrastructure costs of AWS using the third-party provider are significantly higher than the costs on Bluemix. Second, AWS charges data transfer costs; Bluemix does not.

Finally, with AWS, there is a small added cost for purchasing a static IP address for the IHS (load balancer) VM in the WAS ND environment. Having a static IP address is necessary to prevent the IP address from changing when the VM restarts in AWS. With Bluemix, the VMs in the WAS ND environment have static IPs that never change on VM restarts. However, because all of the VMs are secure behind an OpenVPN firewall, the IHS requires an external static IP, which Bluemix provides at no cost.

Conclusion

Moving an enterprise application to a public cloud environment can help organizations improve flexibility, increase scalability and realize cost-savings benefits. Your organization has many public cloud choices. However, in our analysis, selecting Bluemix helped reduce initial deployment learning, subsequent deployment time and operational costs compared with deploying a WAS ND configuration in the AWS cloud.

Learn more

Explore IBM WebSphere Application Server on Bluemix. Try Bluemix free for 30 days by [registering](https://console.ng.bluemix.net/registration) for Bluemix: <https://console.ng.bluemix.net/registration>

Learn how to quickly and easily provision a fully functional, secure WAS ND environment on Bluemix by reading this [blog](#) and watching the video: ibm.com/developerworks/library/mw-1608-bhadriraju-bluemix-trs/index.html



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¹ Costs were calculated using pricing published for Bluemix (<https://console.ng.bluemix.net/catalog/services/websphere-application-server/?taxonomyNavigation=services>) and AWS (https://aws.amazon.com/marketplace/pp/B06XCQ55NV?qid=1491581110852&sr=0-6&ref_=srh_res_product_title) accessed April 7, 2017. For Bluemix, pricing for the WAS ND plan was USD 0.70 per hour. For AWS, pricing for the WAS ND included the software costs for an m3. medium EC2 instance type (USD 2.88 per hour) plus infrastructure costs (USD 0.127 per hour), equaling USD 3.007 per hour.



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