

October 2020

JungleWP

Thought leadership powering progress for your business

WordPress High Availability

Managed
DevOPS
a leap
forward



JungleWP managed WordPress high availability hosting service is a comprehensive, open, flexible, and interoperable solution that simplifies the process of developing, deploying, scaling, and managing WordPress on Public and private clouds.

This whitepaper introduces the concept of the General Managed Platform-as-a-service (PaaS) and describes the desired capabilities and building blocks that need to be established and proposes an architecture for such a platform.

It also offers a vision to how JungleWP extends the DevOps definition of our managed platform in order to establish a future vision and direction for PaaS as well as outlining the business potential of such a solution making it an enterprise capability that enables organizations to seize market opportunities beyond borders, respond to high demand by achieving high availability, protect brand reputation, and reduce time to customer feedback.

JungleWP's DevOps main objectives are speeding continuous innovation of ideas, automating continuous delivery of those innovations, and providing meaningful feedback and WordPress expertise for continuous learning, thereby putting all the emphasis on deciding what code to change and rolling those deployments with zero downtime.



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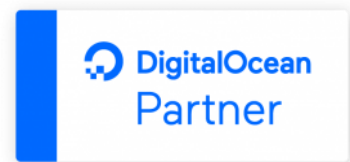
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About the JungleWP Experts Community:

The JungleWP Experts Community is a network of some 100 WordPress top developers and DevOps Industry experts, representing a mix of all skills and backgrounds, and coming from all geographies where JungleWP operates. Officially launched by Pedro Paquemar, CEO of JungleWP, the establishment of this community highlights the importance of innovation in WordPress as a service market and the need for a proactive approach to identify and anticipate game changing technologies.



Hosting Contributor



Plugin Developer



WORDPRESS.ORG

JungleWP's WordPress High Availability Hosting is an easy-to-use fully managed service for orchestrating, deploying and scaling WordPress based applications on a highly available AWS cloud architecture.

You can simply upload your code on GitHub and JungleWP automatically handles the deployment, from capacity provisioning, load balancing, auto-scaling to application health monitoring.

At the same time, JungleWP manages the AWS resources powering your application, with regular care services such as verified updates, vulnerability checks, overhead and spam data cleaning, real-time backup, performance optimization and security hardening.

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Abstract

At its core, DevOps makes delivery of applications more efficient. JungleWP chose Amazon Web Services (AWS) because it has the platform and services to recognize a code change and automate delivery of that change from development, through the support environments, to a production environment at scale.

However, delivery of code is just one aspect of DevOps. JungleWP extends DevOps to include all stakeholders in an organization who develop, operate or benefit from businesses systems. DevOps enables design thinking, which focuses on user outcomes, restless reinvention, and empowering teams to act. In addition, DevOps enables lean and agile methodologies, which guide teams to deliver in smaller increments and get early feedback.

These approaches improve the content and quality of the changes in the application delivery lifecycle. JungleWP provides an engineering approach to implementing DevOps on AWS for WordPress and its existing portfolio of extensions such as WooCommerce, BuddyPress etc...

Through a discovery workshop, we will analyze your WordPress application health, security, and delivery lifecycle. Our goal is to identify areas for improvement, and then execute proof points on your preselected WordPress applications (Blogs, E-commerce, Social networks etc..).

Based on those proof points, we will help you make important decisions tailored to improve and move forward to onboard your new WordPress applications, while also monitoring and measuring impact.

Addressing Data Residency with JungleWP

Data residency is the requirement that all customer content processed and stored in an IT system must remain within a specific country's borders, and it is one of the foremost concerns of governments that want to use commercial cloud services. General cybersecurity concerns and concerns about government requests for data have contributed to a continued focus on keeping data within countries' borders. In fact, some governments have determined that mandating data residency provides an extra layer of security.

This approach, however, is counterproductive to the data protection objectives and the IT modernization and global economic growth goals that many governments have set as milestones. JungleWP addresses the real and perceived security risks expressed by governments when they demand in-country data residency by identifying the most likely and prevalent IT vulnerabilities and security risks, explaining the native security embedded in cloud services, and highlighting the roles and responsibilities of cloud service providers (CSPs), governments, and customers in protecting data.

Large-scale, multinational CSPs, often called hyperscale CSPs, represent a transformational disruption in technology because of how they support their customers with high degrees of efficiency, agility, and innovation as part of world-class security offerings. Hyperscale CSPs, such as AWS, that might be located out of country provide their customers the ability to achieve high levels of data protection through safeguards on their own platform and with turnkey tooling for their customers. They do this while at the same time preserving nation-state regulatory sovereignty.

JungleWP chose to build its cloud infrastructure on top of AWS for security compliance. AWS also considers the commercial, public-sector, and economic effects of data residency policies and offers considerations for governments to evaluate before enforcing requirements that can unintentionally limit public-sector digital transformation goals, in turn possibly leading to increased cybersecurity risk.

AWS continues to engage with governments around the world to hear and address their top-of-mind security concerns. And so, JungleWP takes seriously our commitment to advocate for our customers' interests and enforce security from "ground zero." This means that when customers use JungleWP, they can have the confidence that their data is protected with a level of assurance that meets, if not exceeds, their needs, regardless of where they chose their data to reside.

JungleWP data and infrastructure is decentralized by design. JungleWP allows customers to choose AWS Regions to scale their cloud services, making it impossible for governments where JungleWP operates to collect data. And neither AWS nor JungleWP will replicate customers' data elsewhere unless they choose to do so.

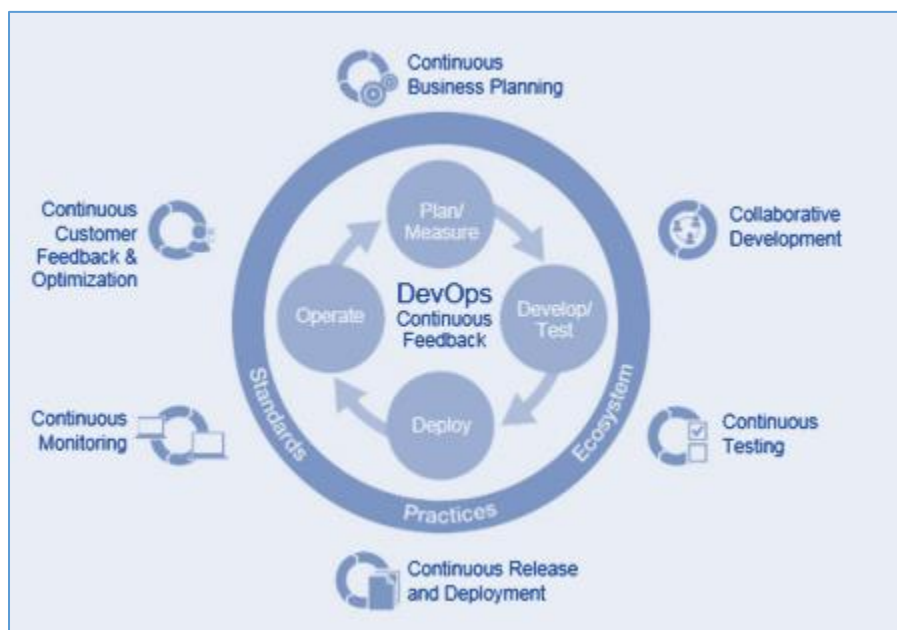
[AWS Data residency White Paper](#)

The JungleWP approach

This paper will provide JungleWP's approach on Managed DevOps, and how deploying on cloud can help you make the most of it. It will discuss practical approaches while focusing on AWS cloud solutions integrated in JungleWP's High Availability architecture. It is the latest in our series of papers highlighting the partnership between JungleWP and AWS to help our joint customers achieve cloud success.

JungleWP defines Managed DevOps as an enterprise capability that enables organizations to save time and resources, seize market opportunities and reduce time to customer feedback, and has five main business objectives:










1. Speeding continuous innovation of ideas by enabling collaborative development and testing across the value chain
2. Enabling continuous delivery of these innovations by automating software delivery processes and eliminating waste, while also helping to meet regulatory concerns
3. Providing a feedback loop for continuous learning from customers by monitoring and optimizing software-driven innovation
4. Deploying and tracking changes in the source code, enabling multiple developers to work together on non-linear development, without any downtime.
5. In addition to checking the health of your deployments, JungleWP also monitors the other resources in your infrastructure and reports missing or incorrectly configured resources that can cause your WordPress application to become unavailable to users.



DevOps enables process and technology

Process

Managed DevOps works with agile, lean, and design thinking to drive the loop of continuous delivery, feedback, and innovation. As we will see when discussing technology, AWS' rapid deployment and data collection feed and improve this cycle.

	Speeding Continuous innovation of ideas	Enabling continuous delivery of these innovations	Providing a feedback loop for continuous learning
Agile • Fast feedback cycles through early customer involvement			
Lean • Value stream mapping • Eliminate waste			
Design thinking • Focus on delivering a delightful user experience			
Cloud operation • Quick and flexible management of development, test and production environments • Resilient and scalable			
Automation • Removing the silos between development and IT operations • Treat infrastructure as code • Continuous delivery of changes			
Application Monitoring • Real-time insight on problems in production • Insight on application usage			

“JungleWP’s Lean and agile thinking guides teams to deliver in smaller increments and get early feedback without impacting production.

As a result, teams reduce cycle time by focusing only on those activities that maximize value based on feedback.

Wasted effort is identified and eliminated, enabling teams to spend time on value-add activities, such as innovation and quality improvements, instead of managing WordPress or Infrastructure maintenance”

JungleWP’s Managed DevOps approach applies these thinking principles to all stakeholders in an organization that develops, operates or benefits from the business’ software systems, including customers, suppliers, and partners. By extending lean principles across the entire software supply chain, DevOps capabilities can improve productivity through accelerated customer feedback cycles, unified measurements and collaboration across an

enterprise, and reduced overhead, duplication and rework.

Design thinking principles include:

- Focus on user experience, and drive business by helping customers achieve their goals
- Restless reinvention: stay essential by treating everything as a prototype
- Move faster by empowering diverse teams to be proactive

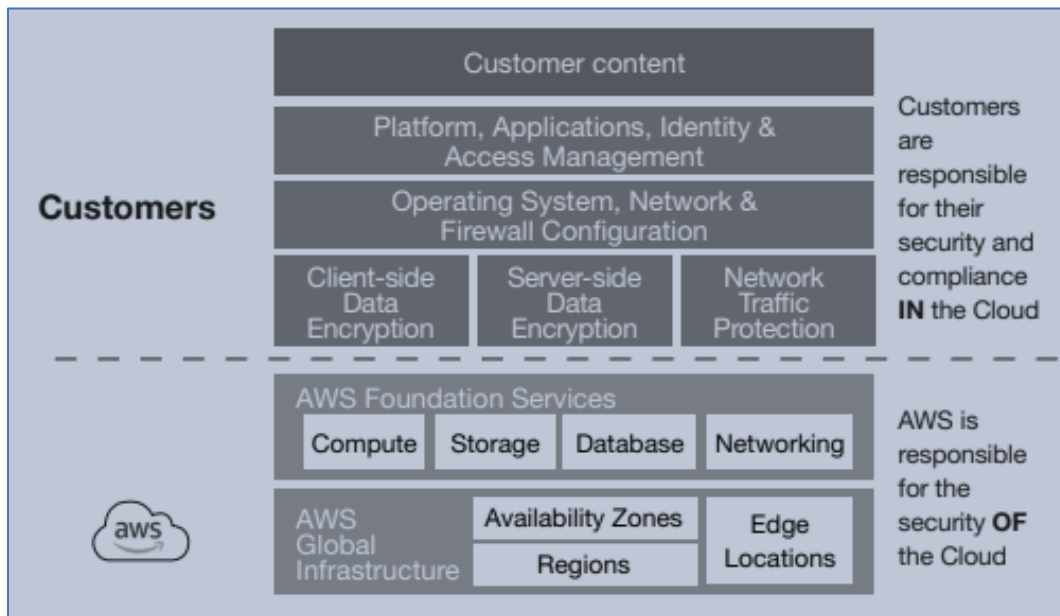
Design thinking provides a complementary set of principles and practices that fits very well with a DevOps approach. In the traditional model, developers are often the furthest removed from the customers. Design thinking reverses this by allowing developers to respond directly to customer feedback. A DevOps team that applies design thinking will focus on achieving their customers’ goals, delivering a quickly expanding minimum viable product based on customer feedback, and empowering team members to fail until they succeed.

Technology

Cloud operations

AWS operates in a [shared responsibility model](#) with the customers for security, compliance and IT controls. For infrastructure as a service (IaaS) services like Amazon EC2, AWS operates, manages and controls the components from the host operating system and virtualization layer down to the physical security of the facilities in which the service operates.

JungleWP assumes responsibility and management of the guest operating system (including updates and security patches), other associated application software, as well as the configuration of the AWS-provided security group firewall as shown below.



JungleWP manages the infrastructure and further up the technology stack and regular WordPress care actions. The table below shows JungleWP responsibilities for different types of services.

AWS provides on-demand delivery of compute, storage, databases, networking and other IT resources. We retain control of how we choose to manage and use these resources in our architecture.

Infrastructure Services	Container Services	WordPress care
Backup and Restore	Backup and Restore	Backup and Restore
Customer IAM	Customer IAM	Verified Core / Plugins / Updates
JungleWP IAM	JungleWP IAM	CDN / Cache setup
WordPress development	Firewall	Data overhead cleaning
Networking/Firewall		Vulnerability checks
Operating System		Errors monitoring

AWS provides a white paper describing the five pillars of a [well-architected framework](#) security, reliability, performance, efficiency, cost optimization, and operational excellence and a set of best practices that align to those pillars. When designing your virtual data center, building and deploying applications in that data center, and managing those applications, you need to be cognizant of AWS' best practices. To read the white paper, visit <https://aws.amazon.com/whitepapers>.

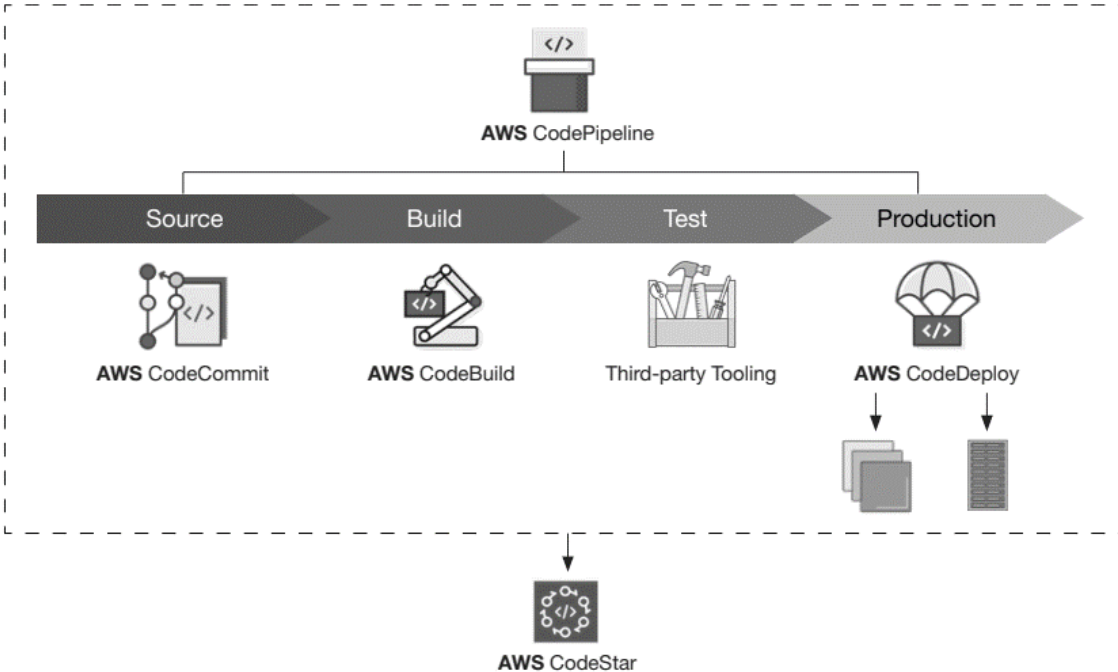
JungleWP properly leverages AWS and third-party services to automate cloud operations, as well as WordPress development lifecycle management. Support environments can be built as needed, and just as easily released. The number of code lines is no longer limited by the number of support environments.

Managing your infrastructure 24/7/365 and maintaining an experienced staff trained in the latest tools around operations requires an investment for work that does not necessarily provide a competitive difference. JungleWP performs this work while your staff focuses on the portion of operations that adds value to your business.

Automation

Continuous integration is a DevOps practice where developers continuously commit their code changes into a source repository. Then, at regular intervals, the system will conduct an automated build, deploy, and test. Continuous delivery expands on continuous integration by automatically deploying code changes through the support environments, pausing for approval before going to production. Continuous deployment does not wait for approval; rather, it goes to production automatically after successfully passing through automated testing in the support environments.

You can use automation technology to build a target support environment that includes application, database and test servers, install and configure middleware and applications, and then execute automated testing. When the testing is completed, the environment can be released. AWS enables this level of automation through its tool sets. AWS also offers a set of code services that JungleWP have extended to provide tools to WordPress developers to implement automation.



WordPress analytics

Understanding how WordPress is being used is valuable to both the business and technology teams. Amazon CloudWatch is a monitoring service for cloud resources and applications that run on AWS. JungleWP uses Amazon CloudWatch to collect and track metrics, collect and monitor log files, and automatically react to changes. The service can also be used to gain systemwide visibility into resource utilization, application performance, and operational health.

Today's analytics capabilities can go far beyond traditional monitoring. For instance, data can be captured about how customers interact with applications. The section on continuous learning later in the paper will touch on some of the tools available we use to help you gain insight into how your customers are interacting with your applications.

Continuous innovation

Businesses are under tremendous pressure to create new value for their customers through innovation. However, they are finding that traditional approaches to WordPress development and hosting at scale are not sufficient to deliver the business innovation their customers expect.

Manual development processes are error-prone, wasteful, and known to cause significant delays. Through proper application of new technology and the principles of continuous innovation, businesses can eliminate these manual tasks, and start delivering value like never before.

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Continuous innovation means continuously developing new ideas into innovative User Experiences, which in turn, can continuously improve the value delivered to customers. JungleWP believes that our managed DevOps is one of the primary means for achieving this sustained innovation.

In its conventional sense, DevOps refers to a closer collaboration between development and operations teams, and the integration of associated processes and tooling. In JungleWP's

point of view, DevOps is much more than that. We believe that DevOps should encompass collaboration among all stakeholders and continuous feedback—not just between development and operations, but also among lines of business, suppliers involved in WordPress custom functionalities, and customers themselves. In this expanded definition, DevOps includes business governance practices around security and compliance, and quality process, such as performances optimizations and WordPress coding standards.

Continuous delivery

The main goal of Managed DevOps is to make delivery more efficient at scale. Support environment availability and configuration is a roadblock that often interferes with achieving this goal. It is important to ensure that the support environment matches the production environment, as a mismatch can introduce significant quality issues.

Additionally, changes to complex systems—even when componentized—can have unexpected results. Requirements, written or verbal, can be misinterpreted. Automating functional and non-functional testing, along with early feedback by stakeholders, is critical to maintaining quality.

Deploying DevOps on JungleWP highly available infrastructure can help address these problems.

Let us start with a working definition of Infrastructure as Code (IaC): the process of managing and provisioning computing infrastructure and its configuration through machine processable definition files, rather than the use of interactive configuration tools.

JungleWP's machine-processable definition files use templates. The templates access the same API

as the AWS Console and the AWS Command Line Interface (CLI). The templates are JSON or YAML formatted text files that should be placed under normal source control. They are also parameterized, allowing the environments to differ in a controlled way.

As an example, a dev environment could use a smaller Amazon EC2 instance (virtual server) than a performance or production environment.

Now, let us walk through the table below as an example of a code change being deployed to production. The environment being built on demand could be far more complex than in this example where there is a single application connecting to a data store. A developer is going to make a change to the application code.

The developer commits a change to the source control repository.
AWS CodeDeploy is instructed by CodePipeline to install and configure the applications in the dev environment.
AWS CodePipeline detects the change, and rebuilds the components affected by the change.
AWS CodePipeline triggers automation testing of the dev environment
AWS CodePipeline repeats the process for the QA environment and then pauses for user acceptance testing.
AWS CodePipeline creates the dev environment using a parameterized JungleWP template. The template would also be stored in the source control repository.
After approval, AWS CodePipeline uses the parameterized templates to build the new production compute environment, and AWS CodeDeploy to deploy the applications.
AWS CodePipeline triggers a brief automation test, and if the environment passes, switches the DNS server to the new compute servers. This is a release technique called blue-green deployment.

The AWS services described in this section are designed to work with standard industry software. For example, AWS CodeCommit is a Git repository.

Continuous learning

As mentioned previously, understanding how an application is being used is valuable to both business and technology teams. In addition to the infrastructure monitoring, JungleWP also check for WordPress related errors, and vulnerabilities. This allow us to share mission-critical insight with teams to help customers improve their WordPress applications.

JungleWP's approach to Managed DevOps in AWS

JungleWP adapted its methodology to provide an engineered approach to implementing DevOps on AWS, this allows us to share with teams and customers important guidelines to use the most of our high availability hosting solution.

Discovery workshop

During a discovery workshop, JungleWP will help your team perform an assessment of your application development lifecycle management (ADLM) through value mapping. This is a lean strategy for analyzing the current “as is” state and designing the future “to be” state of ADLM.

The mapping looks at the full lifecycle documenting each step, to ensure deployment and scaling success.

Data about the effort in man hours and duration, as well as value, is considered. In the end, the discovery. Workshop looks to address bottlenecks in your current pipeline.

Some common examples include:

- WordPress staging and testing.
- WordPress errors and performance debugging
- WordPress development environment
- Deployments, while focusing on increasing automation and testing



In the discovery workshop, you will review your existing WordPress application and explore how we will prepare your installation for automation readiness and discover solutions that can provide quick wins.

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