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TO INFINITY AND BEYOND:
Accelerating Application Migration to the Cloud

INTRODUCTION

It's no secret that more and more organizations are moving their applications to cloud-based infrastructure, but the reality is that cloud adoption is growing even faster than predicted. For many organizations, cloud technologies such as Amazon Web Services (AWS) offer access to flexible, scalable infrastructures at lower cost than on-premises infrastructure. However, there is a common misconception that flexibility and scalability come at the expense of enterprise requirements for governance, security, and compliance. How do you balance the need to accelerate application delivery with organizational and structural requirements—particularly when migrating at scale?

Moving applications to public, private, and hybrid clouds en masse requires a structured and repeatable process, careful attention to the details of configuration and resource management, and enterprise-class control to ensure compliance and security considerations are met. This white paper explores these challenges and shares a proven framework to help enterprises simplify and scale cloud migration.

WHY ARE ENTERPRISES CHOOSING THE CLOUD?

Enterprises are seeing clear benefits of migrating to the cloud because it offers:

- **Flexible access to and instant availability of storage and compute resources**
- **Pay-as-you-go: granular pricing for the resources that teams actually use, with no capital investment required**
- **The potential for the enterprise to enable self-service environment provisioning**
- **Infrastructure monitoring for outages and security breaches**
- **Hardware- and software-level redundancy, plus support for disaster recovery**
- **An efficient, cost-effective way to run and scale containerized applications**
- **Granular control over every aspect of provisioned infrastructure through Infrastructure as a Service (IaaS) products such as Amazon EC2**
- **The ability to launch apps quickly—with minimal user specifications and with automated infrastructure scaling—through products such AWS Fargate**

COMMON CHALLENGES WHEN SHIFTING TO THE CLOUD AT SCALE

For many enterprises, adopting cloud-based infrastructure can save time, money, and frustration for DevOps teams that are charged with delivering features to users faster. Organizations that lay the right groundwork can shift many, if not all, of their applications to public, private, or hybrid clouds. However, enterprises looking to the cloud quickly find that they need to be prepared for key challenges that arise when moving applications to the cloud, at scale.

Ad Hoc Processes Are Expensive, Impede Software Delivery, and Invite Risk

Migrating applications to the cloud is just one step toward accelerating the delivery of features to customers. To succeed with a cloud transformation, organizations must consider the whole delivery process, from ideation to code to production. But when each team sets up their own cloud deployment processes for each project or application, it's difficult to ensure consistency across the enterprise. Manual setup and even automated scripts don't create standardized software delivery processes that work for every application and for every deployment target. And inconsistent processes lead to failed deployments and broken functionality, often caused by lack of release orchestration and missing dependencies.

In addition, without a defined, standard process, teams struggle to reliably migrate from legacy environments to cloud resources, or to move applications from one cloud to another, be it across vendors or from private to public to hybrid. Finally, lack of repeatable processes creates vendor lock-in and inhibits flexibility to run your apps where they are most efficient.

Lack of Visibility Leads to Failed Releases and Skyrocketing Costs

As cloud usage scales to hundreds of applications and thousands of deployments, it becomes more and more important for teams to have visibility into what version of each application is deployed in each cloud-based environment, and into which applications and services depend on each other—especially as every team creates their own release and deployment procedures. Lack of visibility on cloud usage leads to cost overruns due to forgotten, unused cloud instances and services.

Beyond the development team, other people who are involved in the software delivery process—such as QA testers, product owners, security officers, and other business stakeholders—need to know where applications are in the release cycle and what features are coming in the next release. Lack of visibility on the release process can lead to failed deployments and disappointed customers.

Security and Compliance Requirements Go Unmet

Deploying applications to cloud-based instances instead of on-premises infrastructure doesn't eliminate the need to meet IT compliance requirements. Applications that are shifted to the cloud must meet the same compliance and security standards as all other applications.

As organizations move beyond pilots for the cloud, they struggle to maintain control of the processes and checkpoints that ensure security and compliance requirements are met. Teams that migrate applications often create their own Continuous Integration and Continuous Delivery pipelines that operate outside standard compliance and security procedures, and that often exclude compliance team members. Without a way to enforce security testing and code compliance checks, vulnerable software can end up in the cloud, and compliance violations can result in steep fines for the organization.

Manual and Scripted Configurations Don't Scale as Cloud Usage Grows

Teams start out small, migrating one or two applications to the cloud as an experiment. As they figure out what's needed, it's natural for them to execute cloud deployments manually or to write deployment scripts. But as cloud usage moves beyond the pilot phase and grows across the organization, teams find they've scripted themselves into an unscalable situation.

It isn't just cloud processes that need to be created, tested, and standardized. A Production-ready cloud instance requires teams to set up network interfaces, IP addresses, virtual networks, security rules, subnets, route tables... and potentially more. Without a way to standardize cloud configurations and store them in a central location, different configurations proliferate across the organization, and it's hard for teams to benefit from the lessons learned and best practices uncovered by other teams.

Cloud Expertise Is Expensive and Scarce

Migrating applications from on-premises infrastructure and legacy middleware systems requires a level of cloud expertise that is hard to find. Heterogeneous application teams that have not developed this cloud knowledge may have difficulty adapting their applications and designing cloud-based architectures in a way that scales for long-term, enterprise-level storage, bandwidth, and security requirements.

Without an efficient, scalable software delivery strategy, migrating applications to the cloud can lead to extensive wasted effort as development teams spend their time tweaking, troubleshooting, and maintaining cloud deployment processes instead of building value-adding application features. If teams aren't careful how they proceed, ad hoc, experimental deployment practices become the de facto but unscalable standard as other teams across the enterprise start to move their applications to the cloud.

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The Cloud Empowers Built-in Ops for Dev

It can be challenging for development teams to design cloud-based infrastructure in a way that scales for enterprise needs. Services such as AWS Service Catalog allow operations teams to architect, create, and manage approved cloud configurations that development teams across the organization can self-service provision as needed. Operations can apply their expertise to infrastructure design and retain control over security and resource usage, while Development can take advantage of the flexibility and velocity of the cloud.

EFFECTIVE APP MIGRATION REQUIRES A DEVOPS FRAMEWORK DESIGNED FOR THE CLOUD

Enterprises delivering DevOps at scale need a framework that abstracts configurations and infrastructure and that enforces consistent processes across all teams and environments. And they need a DevOps-focused framework that's designed for the unique needs of cloud-based and hybrid applications:

- **On-demand cloud resources** to eliminate long waits and manual approvals for cloud- based instances. Teams must be able to provision cloud resources on a "just-in-time basis" as part of their Continuous Integration and Continuous Delivery pipelines, and avoid cost overruns by automatically de-provisioning resources that are no longer needed.
- **Intelligent oversight of complex release pipelines** that enable teams to manage and orchestrate complex processes for multi-component applications, and automatically visualize, manage, and map dependencies across applications and environments.
- **Standardized processes that are technology agnostic across all environments**. Automated, standardized, repeatable processes that work for hybrid environments prevent teams from having to create custom deployment scripts each time. And centralizing configuration data reduces duplicate work and promotes reuse of vetted, approved cloud configurations.
- **Complete visibility into release status, including component and change status, from backlog to code to production.** Everyone who is involved in the software delivery process needs real-time visibility into all aspects of release status and components, across all "locations" and systems, so they can confirm what is deployed where, and verify that dependencies are satisfied.
- **IT governance that is enforced as part of the core process.** Security and compliance checks must be locked into the software delivery process, no matter whether you use automated security testing tools, manual security and compliance reviews, or both—with the capability to ensure that teams don't skip these important steps in the process. It's also important to take the burden off development teams by collecting the data needed to meet reporting and audit requirements— automatically, every time.

A DevOps-focused, cloud-ready Application Release Orchestration and Deployment Automation framework enables enterprises to implement software delivery in the public, private, or hybrid cloud at scale. Application Release Orchestration automates the entire release process and makes it repeatable and scalable by orchestrating the build, test, provisioning, configuration management, change management, and deployment tools in the software delivery pipeline. Deployment Automation executes the steps needed to deploy an application in a standardized, repeatable way to development, test, pre-production, and production environments.

Accelerate App Migration to the Cloud with Digital.ai

As an Application Release Orchestration and Deployment Automation solution that is top-ranked by industry analysts, Digital.ai (formerly XebiaLabs) provides the extra rocket boost enterprises need to launch their applications from on-premises infrastructure to the cloud quickly and at scale. Critical capabilities include:

- **Automation, orchestration, and management** of complex software release pipelines, deployment processes, and configurations
- **On-demand provisioning and de-provisioning** of cloud-based resources as part of the DevOps
- **Automation of application deployments** across a hybrid mix of clouds, containers, virtual machines, and traditional environments
- **Dependency management** between application components and microservices across the complete Continuous Delivery pipeline
- **Detailed visibility** into where features are in the release pipeline and what versions of applications are deployed across all environments—easily accessible to both technical and non-technical teams
- **Built-in, granular control of your processes,** including automated security testing, compliance review and approval, IT governance enforcement, and audit trail capture—all automatically built into the release process

With Digital.ai, you can lift and shift applications to the cloud fast—in an automated, standardized, repeatable way—so your development teams can stop worrying about "making the cloud work" and focus on building value-adding features.

Integrate AWS Service Catalog and Digital.ai-curated cloud resources into the DevOps pipeline

Digital.ai's integration with AWS Service Catalog provides enterprises with access to approved and curated cloud resources with unmatched simplicity, speed, and control. It seamlessly connects AWS services to the rest of the enterprise DevOps pipeline and enables a structured software release process that includes governance, compliance, and security requirements. The combination allows DevOps and cloud teams to create centrally managed DevOps pipelines along with portfolios of approved AWS services. These services are provided through the AWS Service Catalog, which lets cloud administrators pre-configure the setup, control access, and provide teams across the organization with instant access to the AWS resources they need.

READY-TO-GO INTEGRATIONS PROVIDE EXTRA ROCKET BOOST

Digital.ai's integrations and features simplify and accelerate the way companies migrate applications to the cloud:

- **Extensive support for AWS services and cloud resources:** Digital.ai offers extensive support for a large number of AWS services, including Amazon Elastic Compute Cloud (EC2), Amazon Simple Storage Service (S3), AWS Lambda, AWS Fargate, Amazon Elastic Container Service (ECS), Amazon Elastic Container Service for Kubernetes (EKS), Amazon Elastic Container Registry (ECR), AWS CloudFormation, Amazon Elastic Block Store (EBS), AWS Elastic Load Balancing (ELB), Amazon Relational Database Service (RDS), AWS CodePipeline, and Amazon API Gateway.

- **Simplified cloud adoption for developers with DevOps as Code and best-practice reference architectures:** The Digital.ai Value Stream Platform streamlines work for all users involved in releasing software, from developers to Ops to business users. In addition to its simple and powerful GUI, Digital.ai allows developers to start releases, provision cloud resources, and deploy applications directly from YAML files that they can store in version control alongside their application code. Best-practice reference architectures for AWS enable teams to deploy a microservices-based container application to EKS, to deploy a monolithic container application to ECS, and to deploy a big-data data lake solution to EC2.

Launch to the Cloud and Beyond with Digital.ai

Use Digital.ai to accelerate migration of your applications to the cloud, at scale, with enterprise control and with ease!

- Lift and shift applications to the cloud in an **automated, repeatable, scalable** way

- **Orchestrate and standardize complex release processes** for cloud-based applications, and automatically **visualize, manage,** and **map dependencies**

- Provide **real-time visibility** into all aspects of release processes and components, across all "locations" and systems

- Maintain infrastructure to **address security, compliance, audit,** and even **reporting needs**—automatically, every time

About Digital.ai

Digital.ai enables enterprises to focus on outcomes instead of outputs, create greater business value faster, and deliver secure digital experiences their customers trust. The Digital.ai Value Stream Platform seamlessly integrates all the disparate tools and processes across the various value streams, uses data and AI/ML to create connective tissue between them, and provides the real-time, contextual insights required to drive and sustain successful digital transformation. With Digital.ai, enterprises have the visibility they've been seeking to deliver value, drive growth, increase profitability, reduce security risk, and improve customer experience. **Learn more at digital.ai**