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RELEASE PIPELINE ORCHESTRATION:
An Essential Practice for Continuous Delivery at Enterprise Scale

Business is Challenging Software Delivery

Software development and delivery has become a competitive imperative for companies of all sizes and industries. The big challenge for companies today is how to deliver the right features to their customers faster, without risk of failure or delay. Today's end users have demanding expectations that are increasingly shaped by the experience of web and mobile applications that "just keep doing more".

With competitors releasing new features daily or even hourly, enterprises can no longer afford unpredictable, lengthy and inefficient release processes that barely support one update every few months. Driven by market and customer pressures, industry leaders are focused on accelerating and streamlining their release process in order to stay ahead of the game.
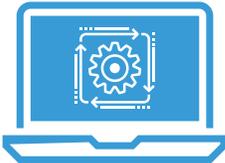
Leading enterprises are seeing great benefits from Continuous Delivery as they implement the initial steps of continuous integration, deployment automation and test automation. But they struggle as they try to scale with their current arsenal of tools, processes and steps. They find they need a scalable way to manage and orchestrate the release pipeline in order to move fast enough to meet the needs of Dev, Ops, the business... and ultimately, the customer.

Today's Release Planning and Management Methods Cannot Keep Up

In most organizations, planning all the steps to complete and release features into production—the steps that make up a release—is a time-consuming and effort-intensive process.

In long meetings involving the entire release team, the release manager draws up spreadsheets or documents defining the release plan, as well as any additional paperwork required by the project management process, such as ITIL or PMI. Plans are modified a number of times by multiple people, and team members often wind up working from different versions of the release documents.

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Today's Release Management Process

✔ Copious spreadsheets, Word docs and emails, often with everyone working from different versions

✔ Daily status meetings, often early in the morning

✔ Frenzied phone calls to get the latest status and track down issues

✔ No visibility across the business

✔ No good way to capture changes for audit purposes

When the time comes to execute the release, the technical teams use an entirely different suite of tools to carry out the work: build and Continuous Integration tooling, test scripts, Deployment Automation solutions and more. Since there is no link between the planning tools and the execution tools, the release manager must continuously chase the technical teams to find out how things are going, often through much-loved, early morning status calls every day.

Reality often plays out differently from the plan, and managers discover discrepancies late in the cycle. Each unpleasant surprise requires immediate and reactive action. Emergency re-planning results in yet more versions of the release documents, or worse, issues get fixed without documentation or an audit trail.

Release managers have little or no advance warning of potential conflicts, delays or bottlenecks within and especially across releases, so they can't act early to prevent surprises. And lack of shared insight between the technical and management team members creates highly reactive and stressful releases.

One level up, product owners, service delivery managers and business owners lack critical data to compare and analyze releases across the entire portfolio. They need to identify process improvements to accelerate and streamline feature delivery.

Continuous Delivery Doesn't Scale Without Release Orchestration

To release software quickly while continuously improving quality, most organizations have been turning to DevOps and/or Continuous Delivery.

The first steps typically include introducing Continuous Integration tools such as Jenkins or Bamboo, Deployment Automation tooling such as XebiaLabs' XL Deploy, test automation, and tools for on-demand provisioning and configuration, like Puppet, Chef and Ansible. But even with all of these tools in place, many tasks are still manual or semi-scripted, and consequently slow and error-prone. And a bigger problem starts to emerge.

With so many tools and so many steps in the release process, how do enterprises integrate everything? How can they orchestrate the necessary steps across all tools in the pipeline and create end-to-end automation?

Small teams often initially start to link simple pipelines together using basic chained jobs or builds in their Continuous Integration tool, like Jenkins. But in enterprise environments, which involve many independent teams and countless applications, these basic attempts quickly turn into a jungle of scripts that must be built and maintained by highly skilled and expensive experts. Companies need a dedicated solution to manage their release pipelines and provide broader efficiency gains, scalability, operational controls and process insight. They need a tool and processes that are flexible, powerful and scalable enough to meet the needs of diverse teams and large organizations.

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Release Orchestration Essentials: Automation, Visibility, Intelligence and Control

Release pipeline orchestration solutions, also known as release orchestration or Application Release Automation (ARA), are designed to help enterprises efficiently manage and optimize their release pipelines. Release pipeline orchestration is a necessary focus for enterprises that want to realize the benefits of Continuous Delivery and DevOps. True enterprise-focused release orchestration solutions offer crucial real-time visibility into release status and, through detailed reporting and analytics, provide the intelligence needed to make the best decisions. Release orchestration tools offer control over the release process, enforcing compliance requirements and also making it easy to modify release plans in an auditable manner. And they manage a mixture of manual and automated tasks that need to be coordinated across multiple teams, both business and technical.

Automation

Multiple factors are driving the need to automate and orchestrate steps in the software release pipeline:
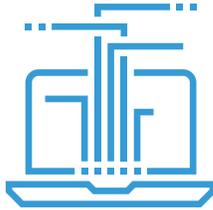
❯ Release processes are lengthy and detailed. Strict compliance and quality regulations add to the complexity

❯ Quick release cycles with smaller feature sets are replacing large monolithic releases

❯ Modern architectures such as microservices involve multiple interrelated components that must all be released and coordinated

❯ Dependencies between components and steps are becoming increasingly complex

❯ Enterprises may release up to hundreds of new updates each week

Together, these factors mean releases have become more complicated than any human being can reasonably manage. Teams need Application Release Automation to ensure the right things happen in the right order and to manage dependencies between components. They also need a way to orchestrate manual steps in the process alongside the automation.
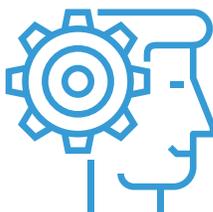
Visibility

Another important foundation for an accelerated, streamlined release process in an enterprise scenario is to provide integrated insight into both technical and management tracks. A release orchestration tool can provide visibility through a single, shared pane of glass for the entire release team from which all manual and automated activities can be tracked and executed.
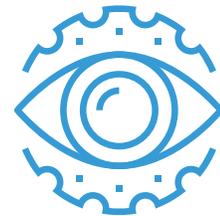
With the kind of real-time status provided by release orchestration, teams have the time and resources to pinpoint common problem tasks and problem dependencies that are slow, unreliable, or that deviate from normal. And they have the insight needed to identify potential issues in advance and prevent bottlenecks.

Intelligence

Release orchestration tools aid the analysis of release pipelines, allowing teams to make data-driven decisions about their products and track the effectiveness of their improvements.

To truly excel at Continuous Delivery, enterprises need more than visibility into the release process: they need detailed reporting to visualize improvement over time, comprehensive metrics, and analytics to provide understanding. They need to have the intelligence to continuously improve the release process and deliver the right applications based on deep insight into user behavior and feedback.

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Typical Release Pipeline Orchestration Requirements for Enterprises

✓ **Automation of software release pipelines, including dependency management**

✓ **Ability to orchestrate both manual and automated tasks**

✓ **A tool that is easy to use for both business and technical users, with no need for special skills**

✓ **Status dashboards, reporting, release metrics and analytics that offer clear visibility into release progress, failures and bottlenecks, and that provide the insights needed for continuous improvement**

✓ **Ready-to-go plugins to orchestrate existing tools in the pipeline, like Jenkins, GitHub, JIRA, Ansible, Chef, Puppet, and ServiceNow**

✓ **Enterprise controls that automatically enforce compliance, security and quality requirements across the software delivery pipeline**

Compliance and Control

Compliance considerations play a key role in how software is built, especially for highly regulated enterprises, such as publicly traded companies, financial services, insurance organizations, government agencies and many others.

At any time, these companies may be called upon to answer the following questions:
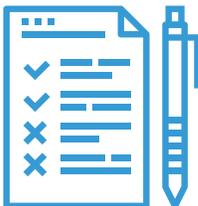
› What changes were made to the software?

› Who did them and when?

› Were they approved?

› Did the company follow the necessary rules for each activity as dictated by SOX, PCI, and other regulations?

› Was the appropriate testing conducted?

› Were permissions properly controlled?

› Do we have evidence to support all of this?

› And much more.

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Enterprise-grade release orchestration tools automatically capture a full audit trail so companies can easily provide the evidence needed to support compliance requirements. They track the evolution of releases and clearly show the degree of deviation from the original plan. They provide the intelligence that teams need to quickly recognize and respond to unpredictable behavior and continuously improve their processes.

In addition, release orchestration tools allow development teams to release software in a self-service way, increasing overall agility and responsiveness. They enforce company compliance processes, standardize release processes and ensure processes are followed. Developers have the freedom to push releases without waiting for other teams to carry out tasks, while Operations can rest assured that steps are not skipped.

Using Other Types of Tools for Release Orchestration

For some enterprises introducing release orchestration, the path of least resistance is to repurpose existing tools, such as continuous integration (for example, Jenkins, Circle CI or TravisCI) and provisioning (like Puppet, Chef, Ansible, and Salt), to try to orchestrate releases. These tools are often already in place, serve a specific purpose and may have basic functionality to enforce the workflow of release steps. However, using tools that are not designed for pipeline release orchestration tends to have pitfalls.

1) Scripting doesn't scale and is difficult to maintain. Extensive scripting is often required to do release orchestration with continuous integration and provisioning tools. But scripts don't model the process and must be manually changed in all places when anything changes.

2) Repurposed technical tools lack visualization, intelligence and reporting capabilities. These insights are necessary in order to truly understand and continuously improve the release process.

3) These tools don't work across the business. They have technical interfaces that don't support the needs of business users, and they don't provide the necessary business-focused views and metrics.

4) They typically lack enterprise-level compliance and security features. Existing tools are not designed to capture audit trails, standardize processes and enforce compliance. And they lack crucial capabilities like role-based access control.

ROI of Release Orchestration

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Release pipeline orchestration solutions offer many benefits:
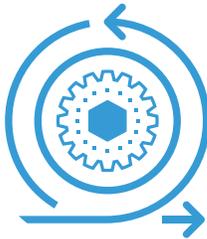
› Accelerate time to market by streamlining and expediting the release pipeline across all tools

› Define and enforce a standard release process across the organization and mitigate risk

› Improve overall quality, reduce the number of errors in releases and prevent last-minute surprises

› Enable data-driven decisions and more predictable releases by providing visibility into release status and contents for all teams, including IT management and business stakeholders

› Save costs: automation requires fewer resources and less fix/re-do work

› Improve the overall software delivery process, allowing flexibility while maintaining control

› Provide auditability and reporting to support compliance and governance requirements

Enterprises that implement release orchestration often reduce the time to release software from months down to days, or even hours. They frequently release software 10-20X more quickly just a few months after implementing release orchestration. And software quality improves dramatically, with enterprises moving from multiple production incidents with every release down to only a few incidents a year.

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.

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