The CloudBees Continuous Delivery Platform

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Continuous delivery encompasses the set of activities you use to ensure you are able to deploy code and configuration changes into production at all times.

For the CEO, continuous delivery means the company can respond quickly and with confidence to new business opportunities and competition. For the CTO and Enterprise Architect, it provides a way for IT to work more efficiently and delivery better service to internal and external stakeholders. For the VP of Engineering, it's a tool to keep a full pipeline of deliverables on track and flowing into production with confidence. For the release manager, continuous delivery reduces schedule risk and it provides better visibility into work in progress. For the Ops team moving to DevOps, it means they can share their tools and processes more naturally with developers while satisfying their many obligations. For the developer, it helps get their work into production more quickly with better quality, while offloading and automating tedious processes.

The challenges to implementing continuous delivery are often more cultural and organizational in nature than they are process and technology oriented. Still, picking a toolchain that helps you move from today's messy reality to exploit tomorrow's opportunities is an important strategic choice. Many companies already have a key component of their strategy in Jenkins CI – the world's most popular open source continuous integration server. The CloudBees® Continuous Delivery Platform provides a rich set of resources to support continuous delivery, from coding activities to testing, staging and production deployments. By building on the power of Jenkins CI, CloudBees enables you to adopt continuous delivery incrementally or organization-wide, supporting both on-premise and cloud-based activities in ways that help you to take advantage of your existing investments and delivery processes.

Continuous Delivery Goes Mainstream

Software developers argue over languages, tools, methodologies, the usefulness of managers and anything else that impacts their ability to deliver working code. What virtually all would agree on, though, is that continuous integration (CI) is critical to them. At its heart, CI ensures that as a developer or ops person changes any code or configuration, a process kicks off to test that the changes "work" before moving the resulting artifacts further toward their destination. Automated CI-driven testing is typically layered from simple unit and functional tests toward more complex and costly suites, with the goal of notifying the creator of the original change as early as possible if their change caused a problem. When you couple CI-driven testing with deployment – typically to a staging area – you've broken out into continuous delivery (CD).

Continuous delivery does not mean you are pushing to production at all times. What it means is that you are confident enough in the quality of your change that you could push to production, or to the next stage of your release pipeline. For example, as a small team in a large organization, you can automate your CD processes in a way that gives you this confidence and ensures the downstream consumers of your changes always consume working product from your team. It's important, therefore, that you be able to integrate your processes with those of the larger organization, without requiring the entire company to adopt your processes. The larger company may have regulatory concerns and a formal change control process between your changes and its customers. Even under the best circumstances, "continuous" to the company might mean a production push on a much slower cadence than you want any particular team to achieve with their deliverables.

With that background, you can start to see why continuous delivery – that methodology that used to live only within large, cutting edge technology companies like Netflix and Facebook – is rapidly becoming a mainstream, achievable goal for companies large and small. Here are the advantages companies realize when they adopt continuous delivery practices:

> » **Smaller incremental deliverables** reduce schedule risk and produce better visibility into work-in-progress. Experimentation and failure are cheap, unlocking new ideas and giving you better feedback to guide investments.

> » **Opportunistic projects**, such as those driven from mobile channels, can be initiated and proceed at a higher pace than those that are tied directly to systems of record. Existing investments in SOA become a springboard for such projects.

> » **DevOps initiatives to treat configuration as code** and to deliver as-a-service naturally augment existing CI investments and agile practices in development.

» **Company initiatives in the cloud** – both private and in the public cloud – become a natural means to get access to resources on-demand and to streamline testing and staging processes.

The CloudBees Platform combines all the pieces together – deep technology investment, integration with existing systems, open source community, real-world experience – to help you deliver on continuous delivery.

CloudBees Platform

The CloudBees Continuous Delivery Platform is unique in its integrated support of development, deployment and runtime activities. Most CI offerings focus on development time, while PaaS and DevOps tools tend to focus on runtime and deployment. A continuous delivery solution really needs to encompass both of these areas. But, continuous delivery isn't a one-size-fits-all proposition – most companies have existing investments, processes and constraints they need to live within and make use of. CloudBees development services give you the tools to build and manage a continuous delivery pipeline on-premise or in the cloud, or to use a mixture of on-premise and cloud resources. Our runtime services include our award winning PaaS that is already integrated with our development services and an ecosystem of best-of-breed partner services as well as an ability to deploy on-premise or to other PaaS offerings.
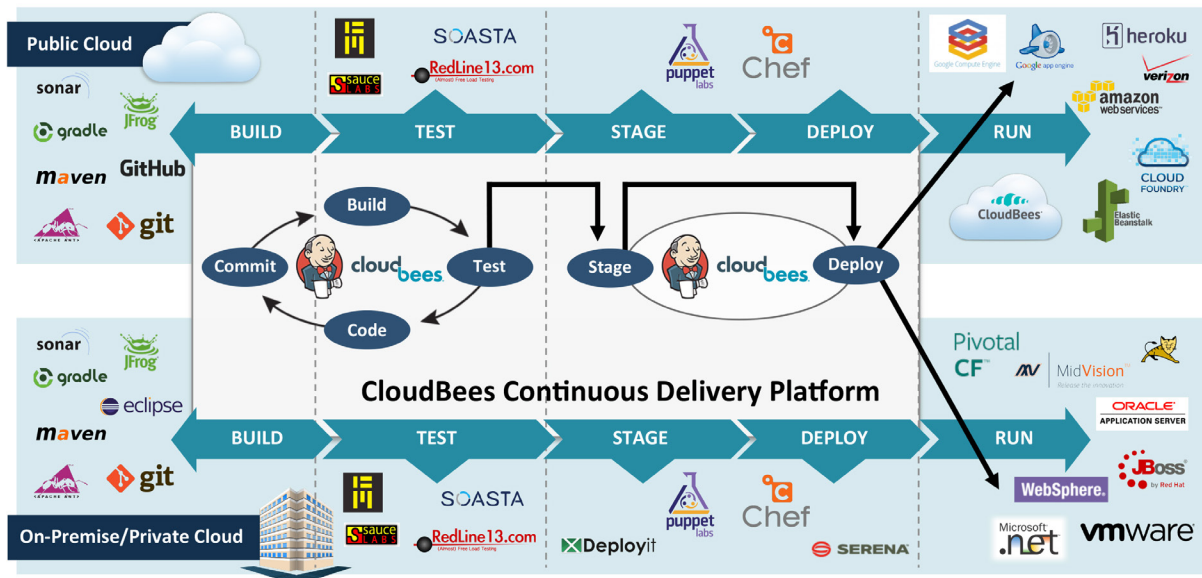

Figure 1: CloudBees Continuous Delivery Platform: scope

Figure 1 illustrates the scope of the CloudBees offering, including:

» The use of Jenkins and CloudBees' extensions to it to access both on-premise and cloud-resident resources and services throughout the software development lifecycle

» Ability to integrate with existing investment tools, technologies and software systems, even in the most complex and secure environments

» Ability to move and track work across stages of delivery, from build and test, to staging and complex deployment scenarios, connecting to existing systems both using native as well as integrated partner-supplied capabilities

» Ability to run applications in production, testing and staging using the CloudBees PaaS or to push to an environment of your choosing.

These features are delivered as a set of products, available as a fully managed cloud service and as a software subscription for on-premise use.
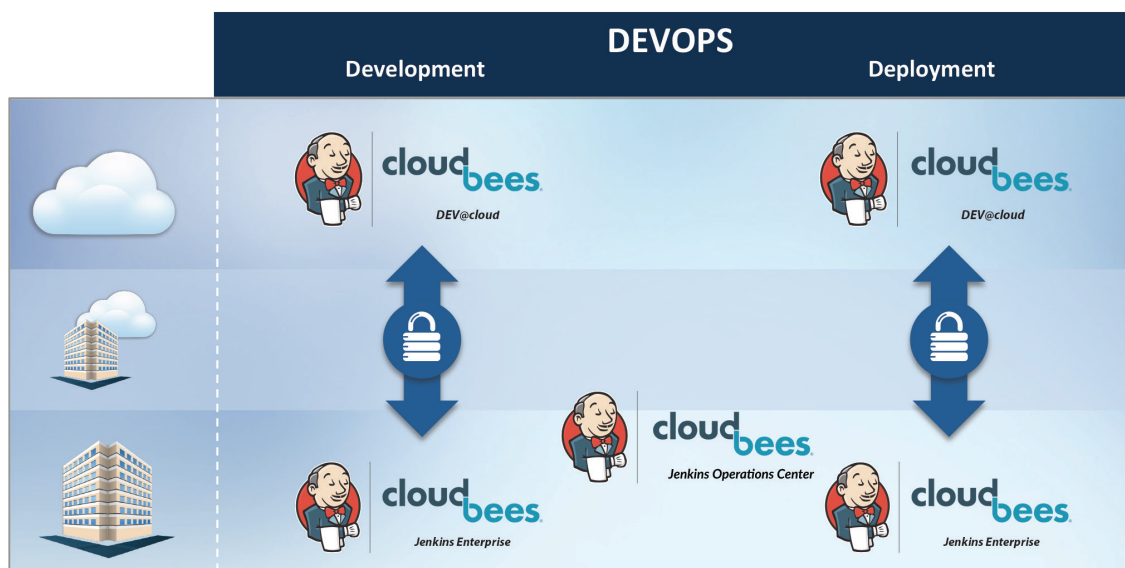

Figure 2: CloudBees Platform components

DEVELOPMENT SERVICES

Jenkins CI, both on-premise and in the cloud, is at the core of the CloudBees Continuous Delivery Platform. CloudBees layers additional enterprise value on open source Jenkins CI in its CloudBees Jenkins Enterprise™ offering and makes it available both on-premise and in the cloud. As it should be, Jenkins is central to your continuous delivery strategy, providing a consistent experience regardless of where you choose to run it.

The CloudBees products available for development services are:

» CloudBees Jenkins Enterprise provides functionality to meet the higher demands of enterprises for High Availability, Role-Based Access Control and more than a dozen other plugins that optimize performance, improve security and help manage large Jenkins installations. Those capabilities are also available in our cloud-hosted version. CloudBees Jenkins Enterprise is available for on-premise Jenkins users as part of our subscription service that also includes Jenkins support by the Jenkins experts.

» For on-premise customers, CloudBees Jenkins Operations Center™ lets you share build agents and other resources between multiple Jenkins masters. Jenkins is often installed in many places across a larger organization and managed by individual teams, each with a pool of executors or build agents that do the work. CloudBees Jenkins Operations Center provides a means to share build agents, use SSO between masters and control update centers (the Jenkins console) for the individual masters. CloudBees Jenkins Operations Center improves both utilization and availability of your on-premise build/test resources.

» When you use our Jenkins services in the cloud, DEV@cloud™, it is hosted and fully managed by CloudBees using a large-scale elastic pool, in a secure multi-tenant environment. Standard open source Jenkins CI is also available for free with some usage limits. You can make use of our cloud-hosted build agent pools to instantly extend your on-premise Jenkins footprint, whether from open source Jenkins CI, CloudBees Jenkins Enterprise or CloudBees Jenkins Operations Center. Enterprises can also connect securely via VPN from the cloud to their on-premise resources, like source code repositories and databases. This connectivity enables you to move to or share your build/test environment on CloudBees, but deliver continuously on-premise or to a non-CloudBees production target. Our SAML support ensures you can retain full authorization and access control using your own systems.

RUNTIME SERVICES

You're not doing continuous delivery if you're not deploying, even if your deployment is to a staging area or for functional testing. You can deploy from DEV@cloud to the CloudBees PaaS, RUN@cloud or to other PaaS targets like Google App Engine, CloudFoundry.com and AWS Elastic Beanstalk. You can also

use specific deployment tools that you might already be using, most of which are already supported as Jenkins plugins both on-premise and in the cloud. For example, you can use popular DevOps products like Chef and Puppet with the CloudBees Continuous Delivery Platform. Chef and Puppet (along with other infrastructure orchestration offerings) are often used with Jenkins to track "configuration as code," driving deployment operations not just as application artifacts change, but as configuration artifacts change. You can also use sophisticated deployment engines like those from Midvision and XebiaLabs to deploy your application on top of existing middleware offerings like those from IBM and Oracle.

Using the CloudBees PaaS, RUN@cloud When you use RUN@cloud with DEV@cloud, you get the most tightly integrated continuous delivery capabilities. This includes:

» **Artifact tracking** via fingerprints from code to deployed systems

» **Automatic versioning** of applications, simple rollback as needed, with traceability back to code and builds

» **Use of complete CloudBees SDK** to fully script deployments from within Jenkins, giving you the ability to construct temporary deployment systems for test and then destroy them afterward

» **Support for blue-green deployments**, so a fully working replica of your production or staging system can be deployed to and then switched-to after acceptance testing

ECOSYSTEM

Because there is no one-size-fits-all approach to continuous delivery, the breadth and depth of the supporting ecosystem is incredibly important. Jenkins itself brings over 800 plugins connecting to virtually every existing system within the software development lifecycle.
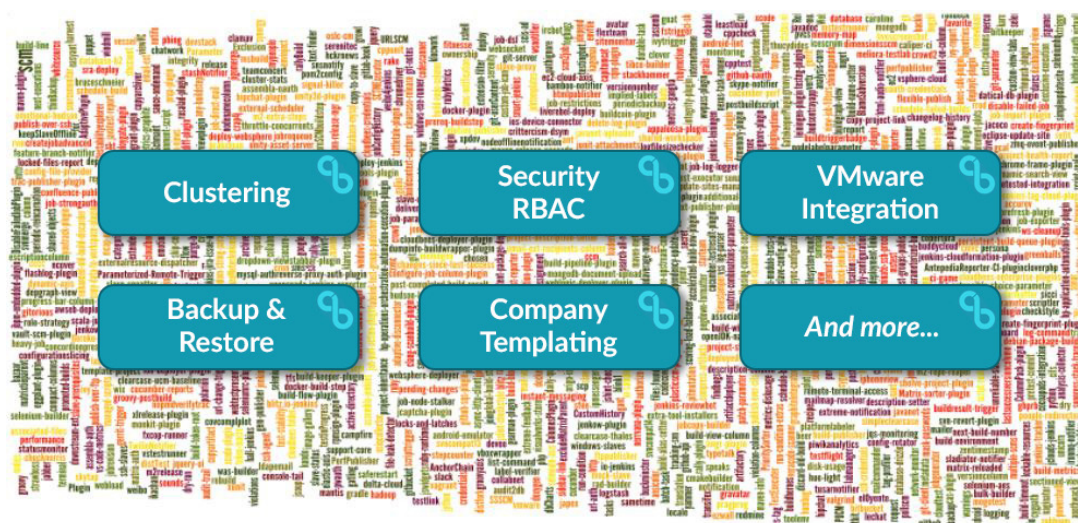

Figure 3: Word cloud of Jenkins open source plugins, with more value from CloudBees

CloudBees then adds value on top of the open source plugins through CloudBees Jenkins Enterprise and CloudBees Jenkins Operations Center for more sophisticated and complex enterprise environments. When you use DEV@cloud and RUN@cloud, you get integrated and verified access to more than 50 best-of-breed partner services in the cloud. These services fill in key parts of the continuous delivery experience, from code analysis to mobile and load testing, to analytics and runtime monitoring. You shouldn't have to pull these capabilities together yourself, they should be ready to go for you, and they are on CloudBees.

Finally, because getting your organization to continuous delivery sometimes requires hands-on experience to help, CloudBees brings over 40 services partners worldwide to you. Along with CloudBees, these partners can help you understand organizational readiness, plot and execute organizational transformations, get you going on agile practice or kick off a pilot project or even write a new Jenkins plugin to meet your specific needs. Enterprises in particular have specific constraints. You often need a trusted partner to help you navigate the best path to bridging the cloud world with your on-premise systems.

Customer Experience

Helping customers across four years of huge industry change means CloudBees has a deep roster of customer case studies showcasing the real benefits of continuous integration and continuous delivery. Whether you're looking for insight from hipster mobile startups like Lose It!, industry disrupters like Choose Digital, thought leaders like Netflix or large scale enterprises like GROUPE ADEO, you can find it on the CloudBees website. In the cloud, on-premise or anywhere in between, CloudBees and Jenkins are strategic choices for some of the largest companies who know their business depends on delivering better software, faster, continuously.

Choose Digital needed a way to get to market first with a "private label" market place for digital content, while preparing for surges in traffic and rapid growth. They chose CloudBees Jenkins based DEV@cloud to accelerate and align development activities with company goals and deploy in the cloud. The results? Development was up to five times faster.

"We use continuous delivery with Jenkins and CloudBees so every developer is accountable for their own code. As a result, the effort of each developer is aligned to the goals of the company and that keeps us lean, focused and fast."

Mario Cruz, CTO, Choose Digital

Acxiom had a common large scale Jenkins challenge – they needed to streamline user management and problem resolution for a large Jenkins deployment with thousands of jobs across a worldwide development team. They rely on CloudBees Jenkins Enterprise for responsive support and role-based access control to Jenkins jobs organized in hierarchical folders. The results are user management activities cut from hours to minutes, Jenkins issues resolved quickly and thousands of dollars saved.

"By itself, the simplified user management made possible by the Folders and Role-Based Access Control plugins justified the cost of CloudBees Jenkins Enterprise. When combined with the responsive, expert support we get from CloudBees, the ROI has far exceeded our expectations."

Brenton Witkowski, Acxiom

Conclusion

Continuous delivery is transforming the way that businesses use their IT assets to connect with customers and partners. Continuous delivery builds on years of hard-won experience in agile processes and continuous integration to bring those benefits to a business level instead of simply being techniques used by development teams. Many of the keys to success are rooted in organizational and cultural transformation, as development and operations personnel learn how to collaborate and share responsibilities. The technology toolchain that enables this transformation, whether organization-wide or locally, likely includes the Jenkins Continuous Integration server. By extending the scale at which open source Jenkins can be used, and by providing a platform that supports a hybrid model for Jenkins – on premise, in the cloud or combined – the CloudBees Continuous Delivery Platform provides organizations with a strong foundation for continuous delivery today and in the future.