Loved by Developers, Trusted by Enterprises:

How to Manage Jenkins at Scale
My banking app is down AGAIN. UGH!

Tom Brady @TheGOAT

Code is customer experience

Max Verstappen @MaxVer

It's great to have my entire financial portfolio at my fingertips! #moneymoves
How does your customer experience compare?
Software delivery defines the winners
So, how do you transform?
Too Slow
TooDisconnected
Too Slow
Too Disconnected
Too Shortsighted
Can’t do it all at enterprise scale

Too Slow
Too Disconnected
Too Shortsighted
Transformation with CloudBees Platform

- Create Fast: Scalable, repeatable workflows
- Continuously Improve: Meaningful feedback loops
- Command Everything: Enhanced visibility, management, and intelligence
- Digital Transformation
- DevOps Maturity
- DevOps Initiatives

Enterprise class security and compliance
Transforming the Banking Experience

HSBC leverages CI/CD technology to power the world’s leading international bank, enabling simpler, better and faster banking, while keeping customers’ money safe and their data secure.

With CloudBees, HSBC:

- +600% increase in release frequency
- Reduced error rates by 60%
- Reduced IT costs by 7%
- +40% improved efficiency
- +20% improved service quality
- Supported all platform environments globally at scale
- Improved team collaboration and reduced siloed thinking

600x Improvement in Release Frequency

60% Reduced Error Rates
From code to customer, continuously advancing business performance
Complete DevOps Platform

- **Continuous Compliance**
  - Real-time code and infrastructure compliance verification
- **Continuous Integration**
  - Build and test at scale
- **Continuous Delivery**
  - Self-service, scalable, repeatable paths to production
- **Continuous Improvement**
  - Enhanced visibility, management, and intelligence
- **Common Data Model**
  - A single source for real-time measurement and contextual correlations and insights
- **Analytics**
  - Progressive roll-out of new features
- **Release Orchestration**
  - Enhanced visibility, management, and intelligence
- **Feature Management**
  - Developers use existing tools and applications
- **CI**
- **CD**
- **Feature Flagging**
  - Progressive roll-out of new features

Developers use existing tools and applications.
CloudBees is your transformation partner.

**Create Fast**
Scalable, repeatable workflows

**Continuously Improve**
Progressive delivery

**Command Everything**
Visibility, management, and intelligence

**Any app, any target platform**
Monoliths to microservices, on-premise to public cloud

**All at Enterprise Scale**
Scalability, security, and compliance

Continuous Delivery
Continuous Improvement
Development consistency across the stack
Self-service, scalable, repeatable paths to production

- Self-service automation
- Security by default
- Model driven deployment
- GitOps / “everything is code”
Progressive delivery to manage, release, and measure features at scale

- Frequent, faster releases with reduced risk
- Targeted rollouts and experimentation
- Integrated across CI/CD
- Continuous, meaningful user feedback

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Higher-order visibility, management, and intelligence

Instrumenting software delivery as a business

- Dynamic and granular views
- Real-time evidence collection
- Full transparency and release data
Higher-order visibility, management, and intelligence

Measuring, analyzing, and communicating how software delivery impacts business performance

- End to end value streams
- Correlated and contextual insights
- Persona-based views for system-wide collaboration
Enterprise scale
Scaling and delivering continuously compliant software

Continuous Compliance
Real-time code and infrastructure verification

Innovation  Risk

Billions of deployments

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CloudBees Software Delivery Platform
From code to customer: continuously advancing business performance

Enterprise Class
Scalability, security, and compliance

Create Fast
Standardized development
CI/CD/Release Orchestration

Continuously Improve
Progressive delivery
Feature Management

Command Everything
Visibility, management, and intelligence
Release Orchestration/Analytics

Professional services and support | Partner network
The Power of Jenkins

- 1800+ plugins
- Flexible Architecture
- Jenkins Configuration as Code
- Pipeline as Code
- Shared Libraries
- ...and more
But, when we are trying to scale the Jenkins...
“Islands of Jenkins”
- Disconnected servers for different teams/geographies
- Teams enjoy great autonomy
- Scalable
- Heavy administrative cost & duplicated infrastructure
- Standardization, governance, and security are difficult
- Cross-team coordination & technology reuse are difficult

“Jenkinstein”
- All teams share a single, centralized server
- Centralized security, compliance controls
- Limited scalability
- Administering needs of diverse teams becomes complex
- Teams slowed down by configurability limits and conflicts
- Teams often opt out, either officially or via “shadow IT”
Open Source Jenkins

Support
Open source solution with a huge plugin ecosystem

Stability
Risky plugin upgrades and rare Jenkins upgrades

Visibility
No transparency how and where Jenkins is used

Lack of Governance
The “island of Jenkins” will most likely go out-of-control

Security
How to assure that people are doing what they are allowed to do

Sharing
No agent sharing capabilities to overcome bottlenecks or technology specific requirements

CI/CD service availability
Normally a big “Jenkinstein” master is a single point of failure

Inefficient infrastructure usage
Jenkins masters are running whether they are needed or not
That is why an Enterprise version of Jenkins is needed
Flexible Architecture - Scalable, Central Management with Autonomy

- **Operations Center**
- **Kubernetes**
- **Bare Metal, VMs, Containers**
- **Dedicated Agents**
- **Shared Agents**

**Rapid Team Onboarding**
** Role-based Access**
** Cluster Operations**
** Plugin Catalog**

**Ephemeral Agents**

**Cluster**
**Operations**
**Plugin**
**Catalog**

**Controller**
**Alpha Team**
**Process Templates**
**Event Triggers**

**Cross-Team Collaboration**

**Controller**
**Bravo Team**

**Controller**
**Charlie Team**
CloudBees CI

Support
24x7 technical support which is globally available

Stability
Tested and verified plugins plus centrally controlled upgrades

Visibility
Cluster wide operations, control and visibility

Governance
One Jenkins master per team to stay independent and centrally managed by Operation Centers

Sharing
Shared agent pool to overcome bottlenecks or technology specific requirements

Efficient infrastructure usage
Due to hibernating Jenkins masters if they are idle

Security
Detailed RBAC and centrally connected to your LDAP

Clarity
Improved service availability based on distributed, lightweight CloudBees Team Masters utilizing market best practices architecture
Leave the Plugin Management to CloudBees

- **CloudBees Assurance Program** with Beekeeper
- CloudBees Verified Plugins, including top OSS Plugins, and LTS Core
- Integrated with CloudBees Update Center ([https://go.cloudbees.com/plugins/](https://go.cloudbees.com/plugins/))

<table>
<thead>
<tr>
<th>Plugin Tier</th>
<th>Tier 1 (Verified)</th>
<th>Tier 2 (Compatible)</th>
<th>Tier 3 (Community)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bug and security fixes</td>
<td>Yes</td>
<td>Yes</td>
<td>Not supported by CloudBees</td>
</tr>
<tr>
<td>New features</td>
<td>Subject to CloudBees priorities</td>
<td>Subject to CloudBees priorities</td>
<td>Not supported by CloudBees</td>
</tr>
<tr>
<td>Verified compatibility</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Verified upgrades</td>
<td>Yes</td>
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Cluster Operations - Centrally Manage All Jenkins Instances

Build Triggers
- Trigger builds remotely (e.g., from scripts)
- Build after other projects are built
- Build periodically

Source
Select the source that should produce the list of Managed masters to run on.
- Client Master / Managed Master With a specified Jenkins URL
- Client Master / Managed Masters Using a specified update center
- From Operations Center Root
- From Parameter
- From Project Parent

Filters
Filters to apply to the source list.

Add Operation
- Managed masters
- Masters
- Update centers

CloudBees
CI/CD service availability
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Managed Controller Hibernation
Cost efficiency in Kubernetes

"I am paying for infrastructure I am not using"

“CloudBees helps you to free unused resources - saving costs and increasing efficiency”

● How?
  ○ Shutdown automatically to release all resources when idle for specified time
  ○ Get back to work when anyone visit them

Yearly cost of a GKE cluster with 5 Jenkins Instances used during Business Hours in Europe
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Role-Based Access Control

- Flexible RBAC model - introduces roles and groups
- Groups can be applied at Operations Center top level, folder level, individual controller level...
- External users and groups can be mapped to CloudBees CI groups
- Permissions propagate down by default, permissions can be pinned using filter
CloudBees CI

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CloudBees CI
Now, Let Us Further Empower the Developers
Configuration as Code - Define Jenkins Template as You Want

- Manage Jenkins
- Configuration as Code for Masters
- Management of Configuration as Code for Masters Bundles

Git → YAML → CloudBees CI Operations Center

- CloudBees CI Controller
- Maven
- CloudBees CI Controller
- Python
- CloudBees CI Controller
- Gradle
- CloudBees CI Controller
- Go
Convert Freestyle Jobs to Declarative Pipelines

Freestyle project
This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any build system, and this can be even used for something other than software build.

Declarative Pipelines

Headache with the pipeline code?
- Do not start from scratch, let CloudBees CI generate it for you!
Pipeline Template Catalogs

Create your own template for the developers!
Cross Team Collaboration

Many pipelines work in sync
Different teams can work on their pipelines and collaborate together from a synced automation execution.

Your team. Your technology
Every team can use different plugins and technologies, but changes don't impact other teams.

Work on different controllers
Isolate teams by controllers, but work together to automate your pipelines.
CloudBees Platform & Services
Connected, automated, end-to-end software delivery

Software Delivery Automation (SDA)

CloudBees CI
Enterprise Jenkins at scale

CloudBees CD/RO
Adaptive Release Orchestration & DevOps Insights

CloudBees Feature Management
Enterprise Feature Flag solution

Open Source
Jenkins

CI/CD & DevOps Services
Consulting
Customer Success Managers
Support

Support
24x7 Technical Support
Assisted Updates
Jenkins Expertise