



How to Manage and Use Jenkins at Scale

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Agenda

Webinar timeframe
11:00am - 12:00pm

- Introduction
 - OSEC
 - CloudBees
- Jenkins & CloudBees
- How to Manage and Use Jenkins at Scale with CloudBees CI
- Summary
- Q&A



OSEC.pl



Specjalizujemy się we wsparciu projektów wywodzących się z OpenSource od 11 lat !



www.osec.pl

Nasze wydarzenia:

<https://osecforum.pl/>

<https://osec.pl/barcamp>

Certyfikat Systemu
Zarządzania Jakością
według normy PN-EN
ISO 9001:2015-10
o numerze 67/2016/P

Specjalizujemy się we wsparciu zarówno wdrożeniowym jak i szkoleniowym naszych klientów, jesteśmy wieloletnim liderem szkoleń rozwiązań RedHat oraz innych,


- EMEA Director's Award FY2019
- Certified Training Partner of the Year FY19 - Eastern Europe & Russia
- Certified Training Partner of the Year FY18 - Eastern Europe & Russia
- Fastest Growing Training Partner FY17 – Eastern Europe & Russia
- Training Partner of the Year FY17 – Eastern Europe & Russia

Nasza oferta :

<https://osec.pl/courses>

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#Microsoft365 #O365 • #Storage #Gluster #CEPH • #CloudInfrastructure #Cloud #OpenStack
#Virtualization #Management • #OpenShift #Kubernetes #Containers #DevOps #SysOps #ISTIO
#Microservices • #Jenkins #Pipelines #CICD • #Ansible #AnsibleTower • #analitka #architektura
#systemdesign #UML #BPMN #usability • #bazydanych #Oracle #MySQL/MariaDB • #Python #Perl #PHP #C
#C++ #Java #API • #ITSecurity #Keycloak #Fortinet • #backup #Veritas #Storware #Bacula • #LINBIT
#LinStor #DRBD • #VDI #Leostream



Every business
is now a software
business



DRIVE INNOVATION QUICKLY



OPTIMIZE DEVELOPMENT + DELIVERY



REDUCE RISK



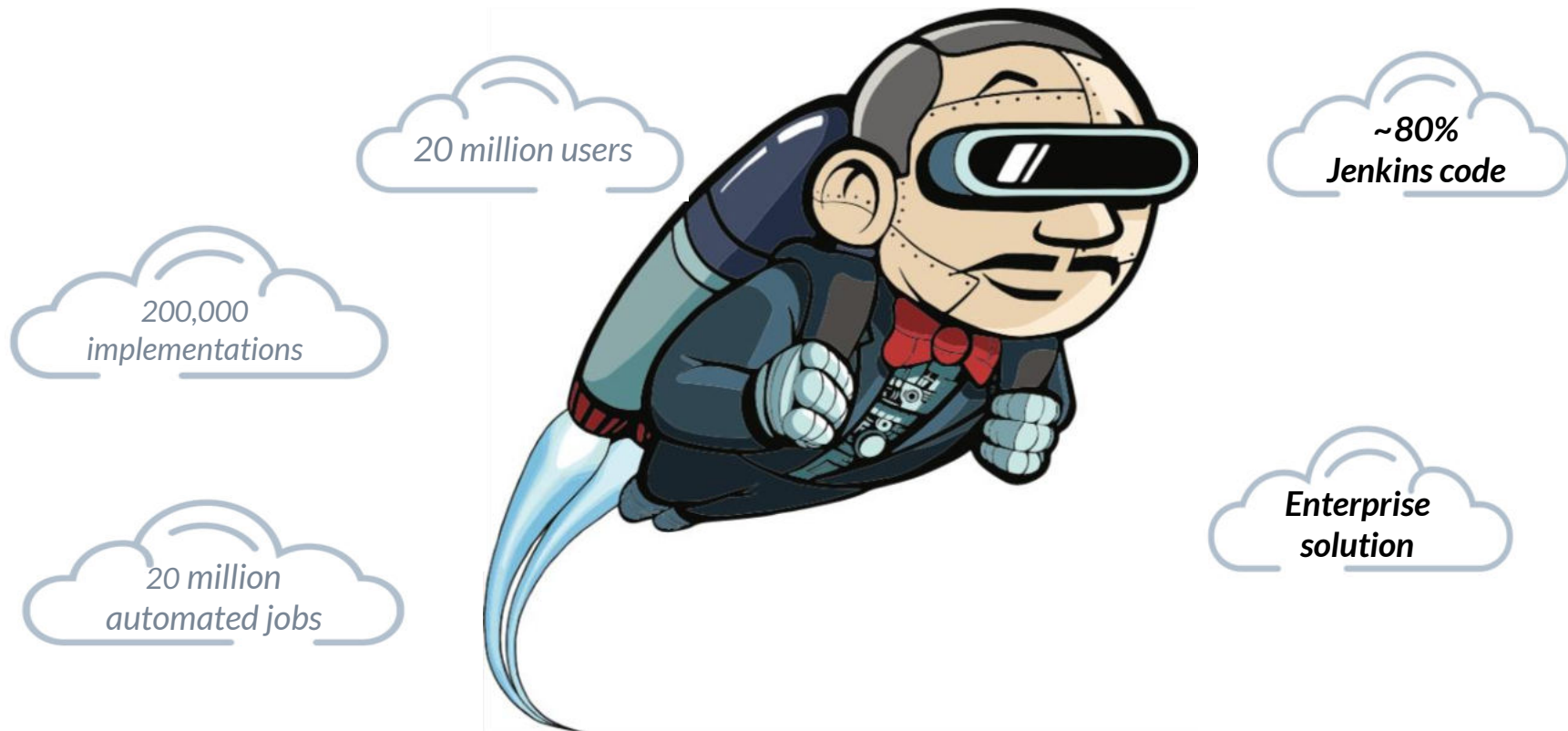


“ *What used to take developers a few days now only takes 10 minutes to complete. This, of course, has an impact on our internal resources, as developers are now more impactful. This newly cultivated productivity saves the company money and helps everyone to move faster.*



Piotr Musial
Manger IT- DevOps

A known secret - CloudBees #1 Jenkins contributor



CloudBees Solutions & Services

Software Delivery Automation



CloudBees CI

Enterprise Jenkins
at scale



CloudBees CD

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

CloudBees Solutions & Services

Software Delivery Automation



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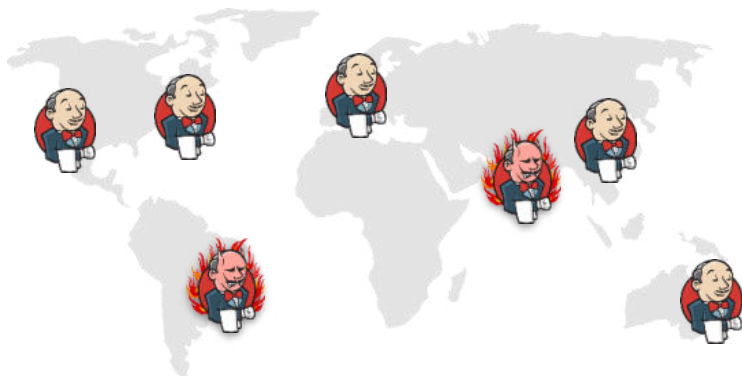
Jenkins Expertise

Power of Jenkins

- Jenkins Configuration as Code
- Pipeline as Code
- Blue Ocean UI (including graphical pipeline editor)
- Shared libraries
- Flexibility (e.g. using Docker agents)
- Plugin ecosystem
- ... and much more

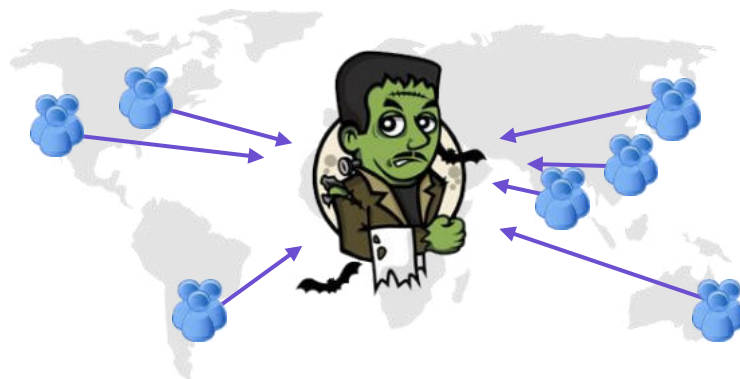


Common Patterns Scaling CI/CD



“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”

CloudBees CI is Enterprise Continuous Integration with Jenkins

- Distributed architecture with a central management
- Central management interface
- Increase stability, efficiency and scalability
- Keeping developers freedom and assuring governance
- Reducing maintenance effort and increase security
- Reusable pipelines applying best practices and assuring compliance

More information: <https://docs.cloudbees.com/docs/cloudbees-ci/latest/feature-definition>

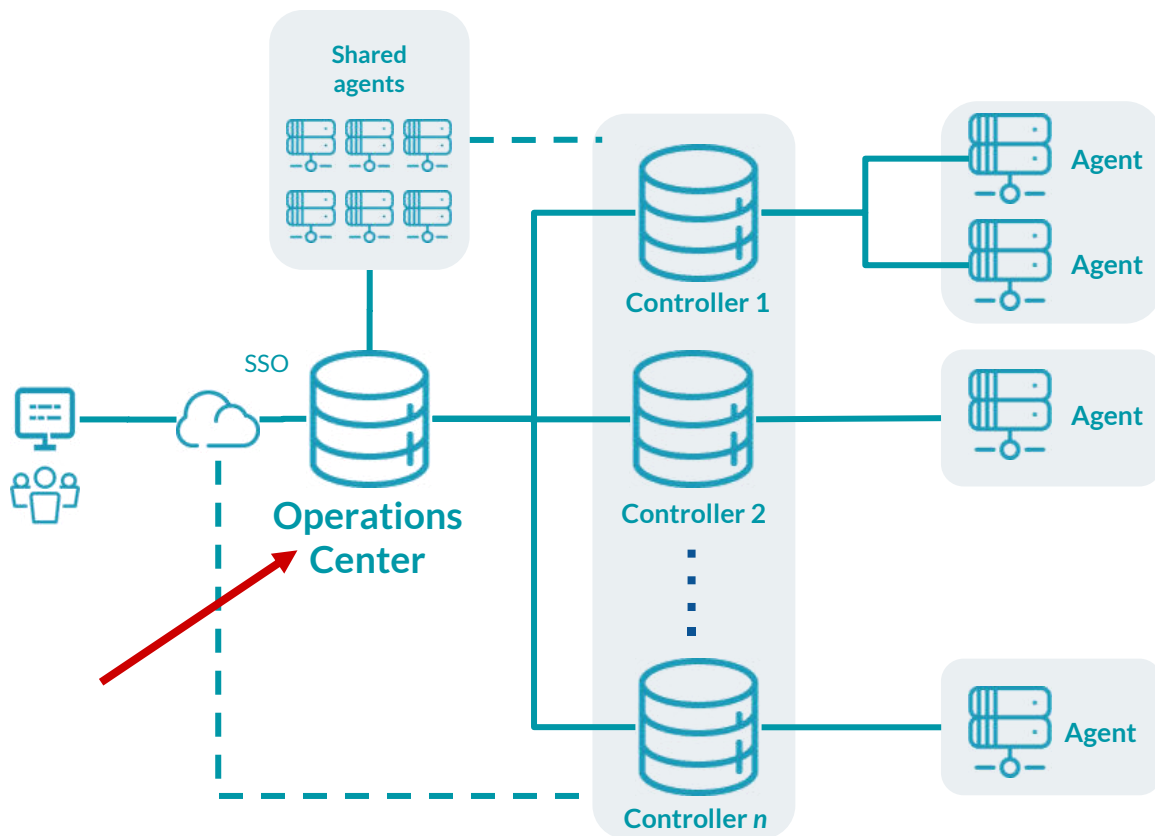


Enterprise Jenkins at Scale

with CloudBees CI



CloudBees CI



Operations Center
"Controller of Controllers"

RBAC and access control
for the cluster

Centralize secure plugin
management

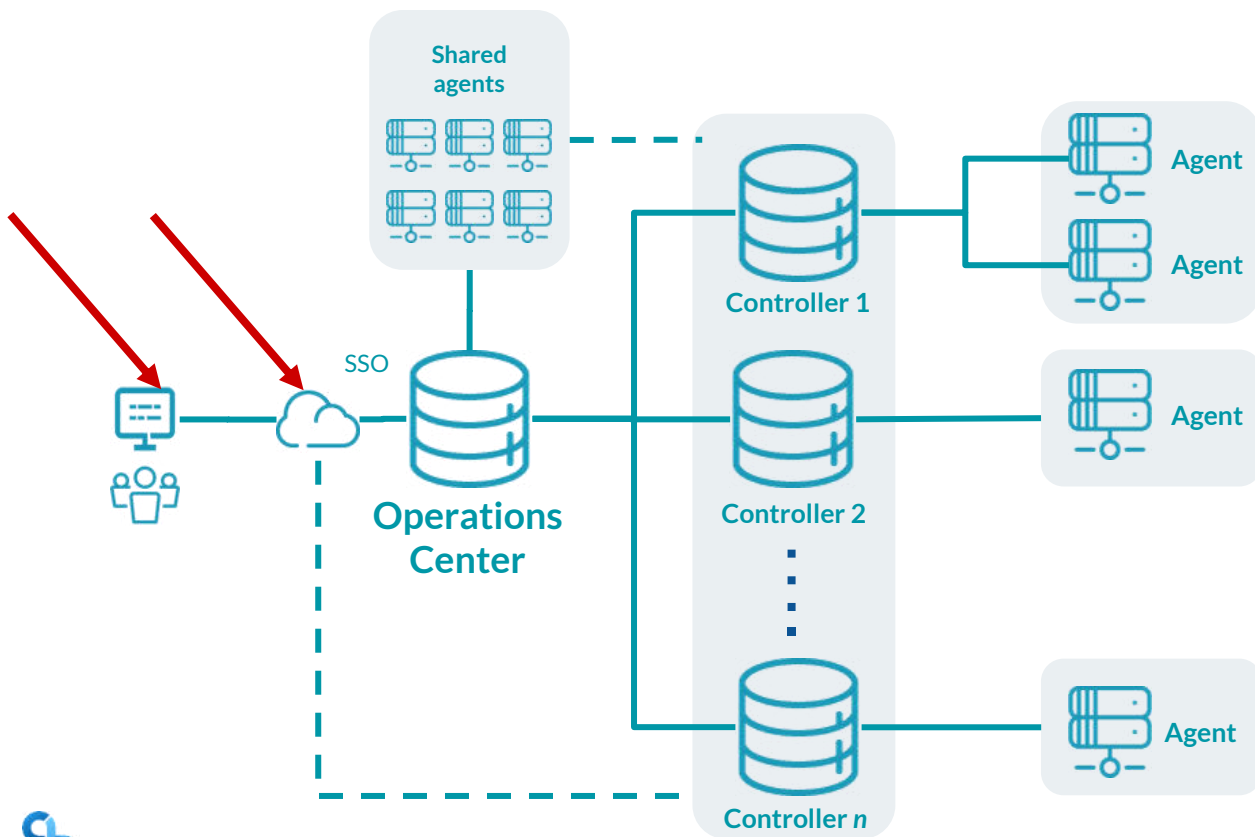
Cluster operations

Controller scalability and
agents management

Shared agents



CloudBees CI



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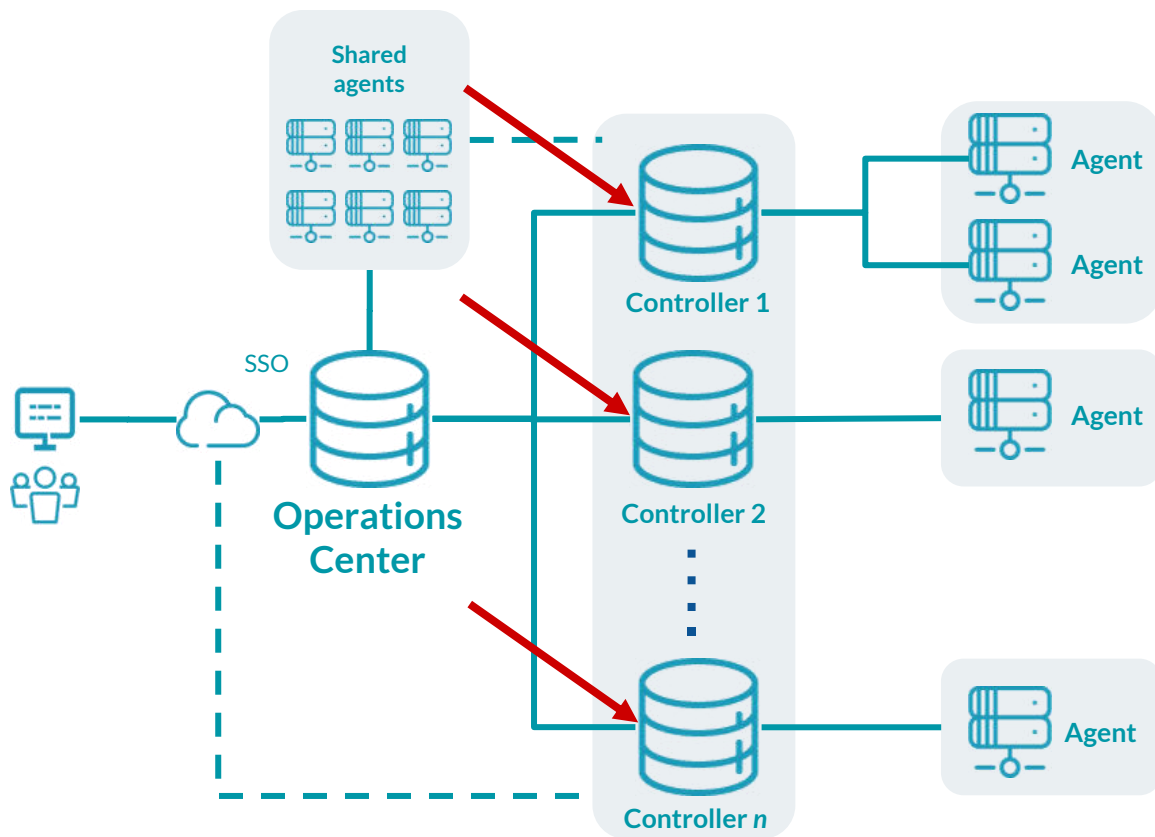
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CloudBees CI



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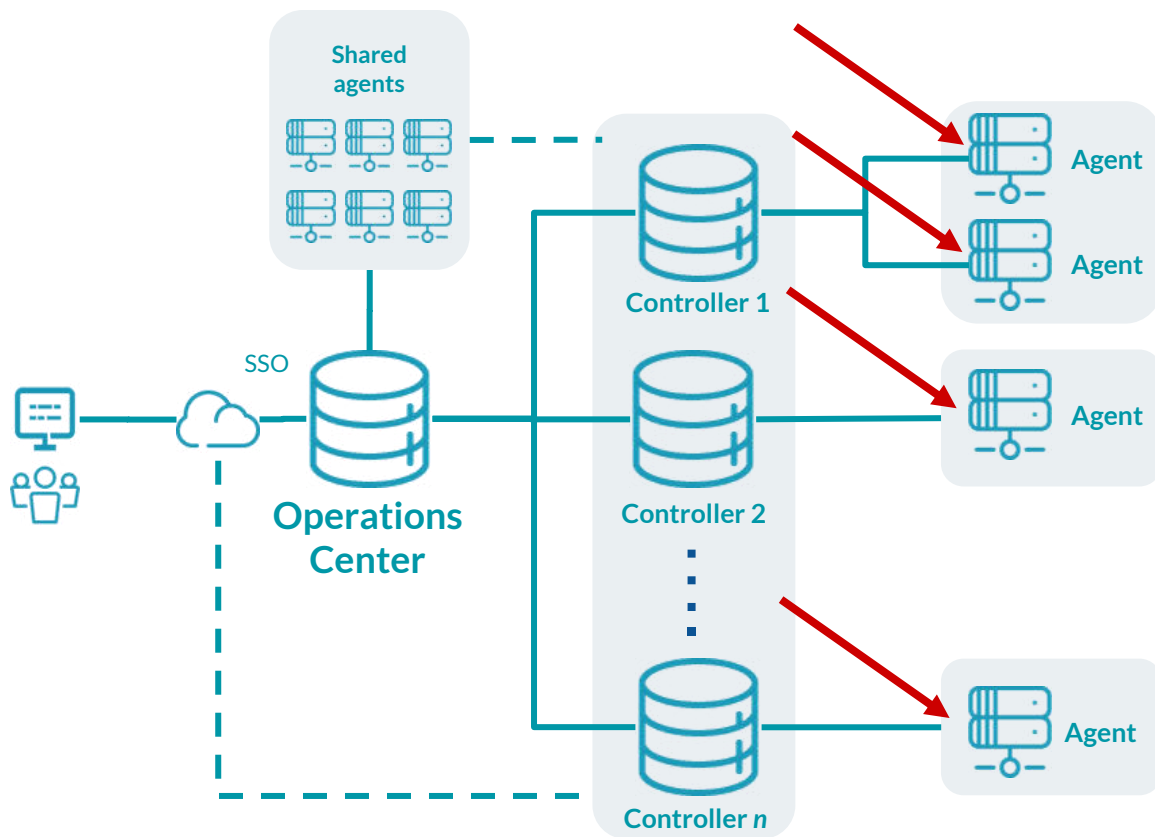
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CloudBees CI



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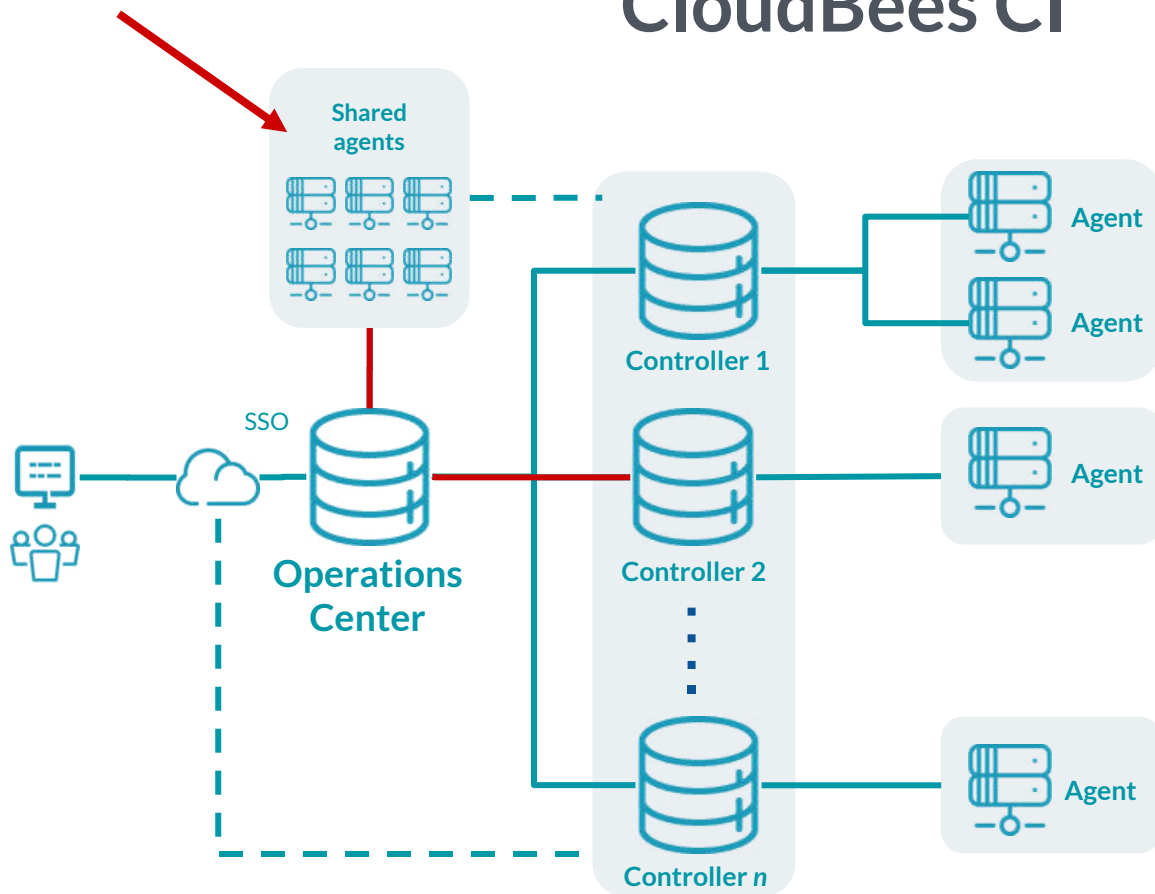
Cluster operations

*Controller scalability and
agents management*

Shared agents



CloudBees CI



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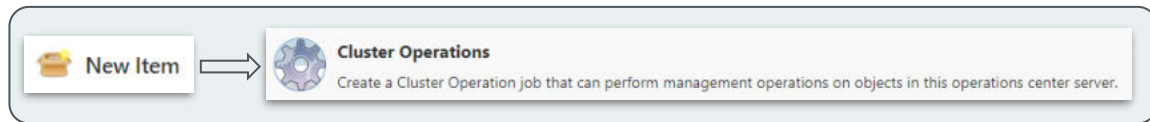
Cluster operations

Controller scalability and
agents management

Shared agents



Cluster Operations



Build Triggers

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

Operations

Add Operation ▾

- Managed masters
- Masters
- Update centers

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 Filter ▾

- Acknowledge error
- Backup Master
- Deprovision
- Disable plugin
- Enable plugin
- Execute Groovy Script on Master
- Install plugin
- Prepare master for shutdown
- Refresh update center metadata
- Reprovision
- Restart Now
- Safe Restart
- Start
- Stop
- Update Docker Image
- Upgrade Jenkins
- Upgrade all plugins

Add Step ▾

More information: <https://docs.cloudbees.com/docs/cloudbees-ci/latest/cloud-admin-guide/cluster-operations>



Kubernetes Controller Hibernation

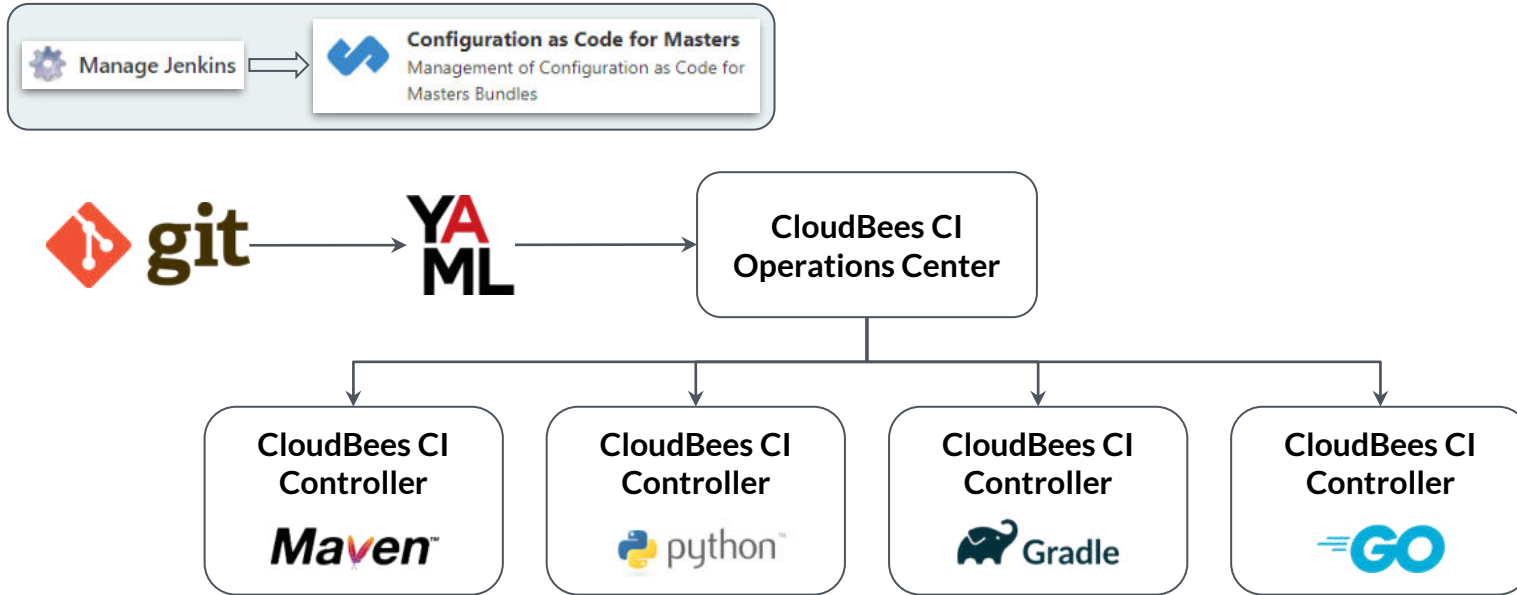
- Set idle time based on traffic to the controller
- Spin controller down when the specified idle time is reached
- When or if traffic is received, intercept the traffic, start the controller, verify it's ready for service and replay the request.
- Controller performs build
- Controller hibernates when idle is reached again
- Fits well with CloudBees' Best Practice recommendation of Controller per team/project.



More information: <https://docs.cloudbees.com/docs/cloudbees-ci/latest/cloud-admin-guide/managing-masters>



Configuration as Code



More information: <https://docs.cloudbees.com/docs/cloudbees-ci/latest/cloud-admin-guide/ci-casc-modern>



Plugin Management



- 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/>)
 - Can inform or auto-remediate
- Plugin Catalog
 - Make sure that your plugins are using the right version
 - Defined at OC level and pushed down to attached controllers (can define which controllers each catalog applies to)
- Use custom CloudBees Update Center for restricting the 'Available' plugins
- Cluster Wide Operations
 - To perform mass changes to controller installed plugins post-provisioning
 - Enforce installed plugins by regularly 'pushing' approved plugin list

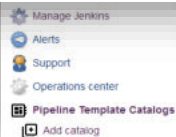
Plugin Tier	Tier 1 (Verified)	Tier 2 (Compatible)	Tier 3 (Community)
Bug and security fixes	Yes	Yes	Not supported by CloudBees
New features	Subject to CloudBees priorities	Subject to CloudBees priorities	Not supported by CloudBees
Verified compatibility	Yes	No	No
Verified upgrades	Yes	No	No

More information: <https://docs.cloudbees.com/docs/admin-resources/latest/plugin-management/>



Pipeline Template Catalog

```
27 stages {  
28   stage('Checkout') {  
29     steps {  
30       git credentialsId: "${github_creds}" , url: "${github_repo}"  
31     }  
32   }  
33   stage('Build') {  
34     steps {
```



Pipeline Template Catalogs

Pipeline template catalogs are defined in a source code repository. The unique **Catalog Name** and **Catalog Display Name** are specified in the `catalog.yaml` file. The **Catalog Display Name** is what is shown in the **New Item** process for creating a new Pipeline project.

Under **Catalog Name**, click a catalog's name to view a list of Pipeline templates defined in that catalog. Click to the right of a catalog's name and choose **Configure catalog** from the drop-down to view the catalog's configuration or resolve any errors with a catalog's import to this master.

Catalog Name	Catalog Display Name	Branch or Tag	Status	Catalog Import Log
 standardMyOrgPipelineCatalog	Pipeline Catalog of the standard pipelines at MyOrg, inc.	master	Healthy	

Icon: S M L

Enter an item name

= Required field



Freestyle project

This is the central feature of Jenkins. Jenkins will build your project, combining any SCM with any tool used for something other than software build.



Multi-configuration project

Suitable for projects that need a large number of different configurations, such as testing on multiple builds, etc.




Java Maven App Pipeline Job

Simple Java App With Maven



Folder Template

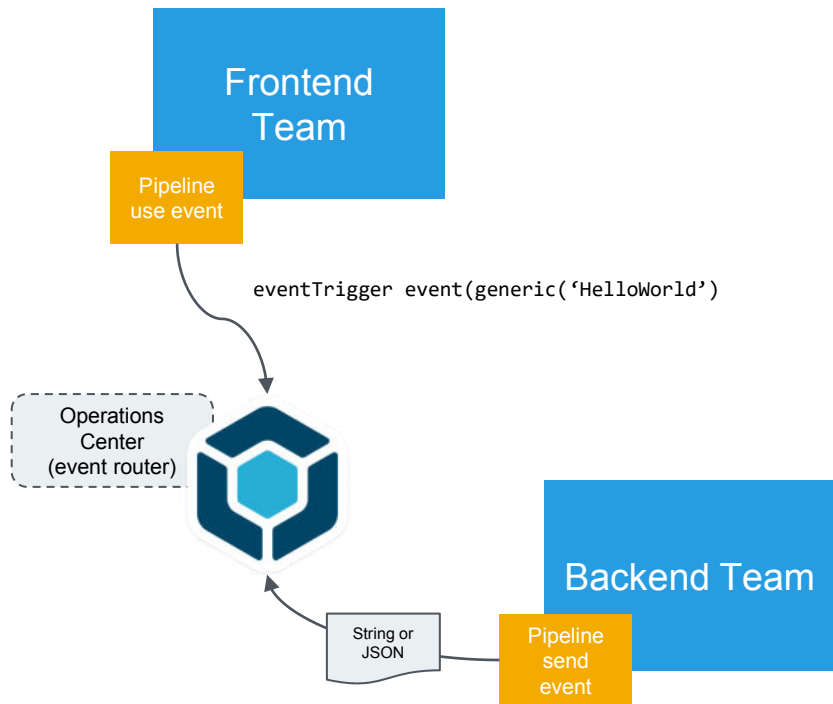
A folder template is useful to model a domain-specific concept that contains other "stuff" in it.

Name	Standard Java App With Maven at MyOrg, inc.
Email address to be used for sending build notifications	My Instanciated Pipeline
GitHub HTTPS repo endpoint	
GitHub Credentials ID	jbriend/***** (github) 
 	

More information: <https://docs.cloudbees.com/docs/admin-resources/latest/pipeline-templates-user-guide/setting-up-a-pipeline-template-catalog>



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

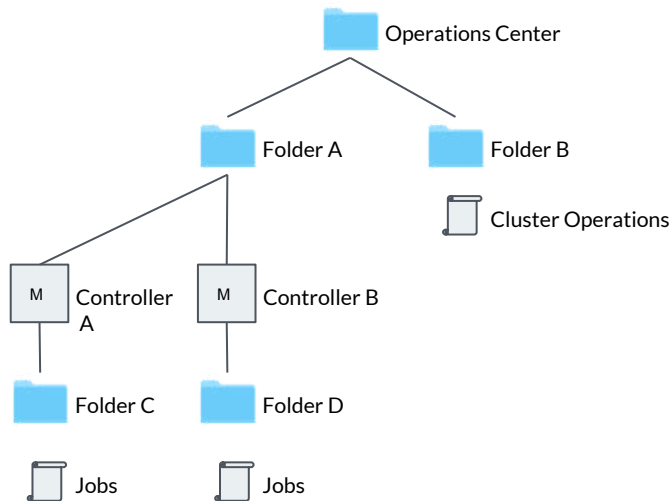
Work on different controllers

Isolate teams by controllers, but work together to automate your pipelines

More information: <https://docs.cloudbees.com/docs/cloudbees-ci/latest/cloud-admin-guide/cross-team-collaboration>



Extended Folder Capabilities



Manage controllers and agents in folder

Make sure your teams have only access to controllers and/or agents they are allowed to use

Create/copy/move items

Let your teams copy or move items across controllers. You can decide what items can be created in a folder

Environment variables

Define environment variables in a folder which can be used in your jobs.

More information: <https://docs.cloudbees.com/docs/cloudbees-ci/latest/cloud-secure-guide/folders-plus>



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

Role	Filterable	Overall	Alerts	Support	Credentials	Agent	Job	Run	View	SCM	Metrics	Group	Role	Update
		Administer	Read	Upload/Plugins	RunScripts	View	Create	Delete	Tag	Read	HealthCheck	View	Configure	Promote
anonymous	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
authenticated	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
administrators	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
developer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Role to add:

More information: <https://docs.cloudbees.com/docs/cloudbees-ci/latest/cloud-secure-guide/rbac>



There is much more....



<https://www.youtube.com/user/CloudBeesTV>



<https://standard.cbu.cloudbees.com/>

CloudBees CI documentation

<https://docs.cloudbees.com/docs/cloudbees-ci/latest/>

- Differences between Jenkins OSS and CloudBees CI: <https://docs.cloudbees.com/docs/cloudbees-ci/latest/feature-definition>
- Shared Agents: <https://docs.cloudbees.com/docs/cloudbees-ci/latest/traditional-admin-guide/shared-agents>
- Plugins: <https://docs.cloudbees.com/plugins/ci>
- User scoped credentials: <https://docs.cloudbees.com/docs/admin-resources/latest/pipelines/user-scoped-creds>
- Custom Update Center: <https://docs.cloudbees.com/docs/admin-resources/latest/plugin-management/update-center>
- Plugins in a secure environment: <https://docs.cloudbees.com/docs/admin-resources/latest/plugin-management/managing-plugins-secure-environment>
- Backup/restore guide: <https://docs.cloudbees.com/docs/admin-resources/latest/backup-restore/>
- Custom HTTPS endpoints: <https://docs.cloudbees.com/docs/cloudbees-ci/latest/traditional-admin-guide/external-http-endpoints>
- Connect Jenkins Controllers to CloudBees CI ("Client Controller"): <https://docs.cloudbees.com/docs/cloudbees-ci/latest/traditional-admin-guide/external-masters>
- CloudBees CI installation using Helm: <https://docs.cloudbees.com/docs/cloudbees-ci/latest/kubernetes-install-guide/installing-kubernetes-using-helm>



Summary





To thrive in a highly competitive and regulated global banking market, BNP Paribas CIB built a high quality, stable and secure software development platform using **CloudBees CI**.

7 to 10X

Faster deployments

“

We are deploying products seven to ten times faster. Some deployments that took hours are now taking Minutes.”



Riad Ghafir

Global Head of Production Factories



Salesforce empowers software developers to create high-quality, secure enterprise apps on its Force.com platform by moving development operations to the cloud using **CloudBees CI** and Amazon EKS.

-97.5%

Time to upgrade

+1,100%

Upgrade frequency



“

Switching to CloudBees CI meant we no longer needed to maintain 35 to 40 static Jenkins agents. This has made tremendous sense in terms of time and cost savings.”



Aaron Nassiry
DevOps Engineer

Q&A





CloudBees®

Thank you