

CI/CD For Auto Deploy

Fundamentals and Benefits

Continuous Integration

- Compile
- Unit Test
- Static Analysis
- Dependency vulnerability testing
- Store artifact

Continuous Deployment

- Creating infrastructure
- Provisioning servers
- Copying files
- Promoting to production
- Smoke Testing (aka Verify)
- Rollbacks

Benefits

Technical Benefit	Business Benefit
Catch Compile Errors After Merge	Less developer time on issues from new developer code
Catch Unit Test Failures	Less bugs in production and less time in testing
Automate Infrastructure Creation	Less human error, Faster deployments
Deploy to Production Without Manual Checks	Less time to market
Automated Smoke Tests	Reduced downtime from a deploy-related crash or major bug

Deployment Strategies

Common Jobs

Step	Description
Integrate Code in a Build	Compile and create artifact
Run Tests	Run unit and/or integration tests
Ensure Infrastructure is Present	Create green infrastructure
Provision the Environment	Configure green instance, migrate DB, etc
Deploy Artifact	Copy artifact files to instance
Run Smoke Tests	Run a few tests that don't impact the prod server
Perform Rollback if Failure	Rollback here is more of a cleanup of green
Switch Router	Redirect traffic to new version
Run Sanity Test	Run a few tests that don't impact the prod server
Perform Rollback If Failure	Rollback here is switching the router back to blue and cleaning up green
Destroy Old Release Environment?	Clean up blue env (<i>optional</i>)
Notify The Team (Successful)	Celebrate!

Configuration Management Tool

- **Installable/On-Prem**

Tool	Creator/Maintainer	Differentiators
Jenkins	Various Contributors	Vibrant open-source community, 100% free
Gitlab Community	Gitlab	Open-source, installable version of the popular cloud-based service, 100% free
Team City	JetBrains	Very mature, JetBrains support
Team Foundation Server (TFS)	Microsoft	Seamless integration with Microsoft products, Microsoft support

Configuration Management Tool

- **Cloud-Based**

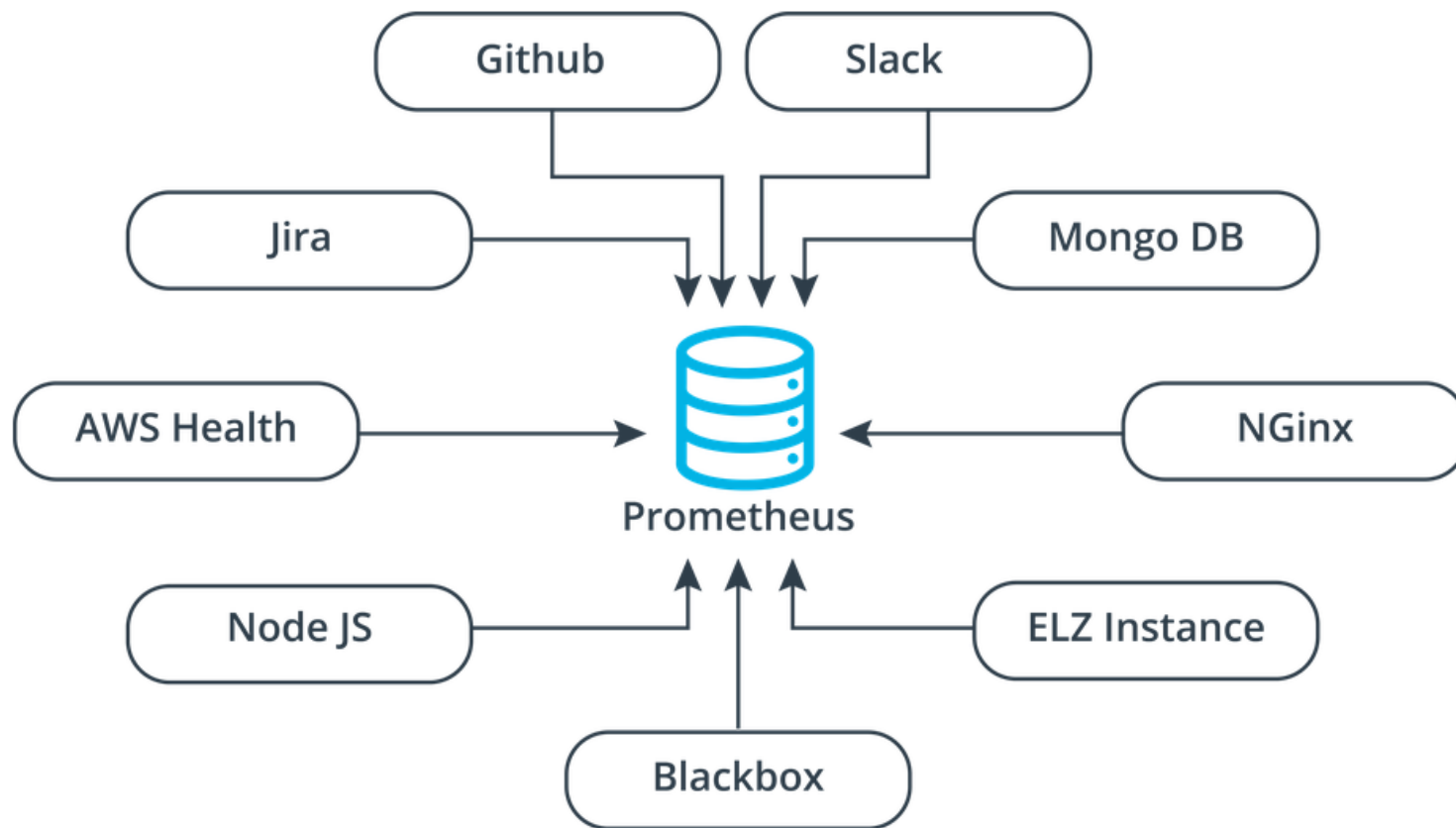
Tool	Creator/Maintainer	Differentiators
Bamboo	Atlassian	Integrates well with other Atlassian products like Stride and Jira.
Circle CI	Circle Internet Services	Free for limited use, personal or business. Boasts of faster builds.
Travis CI	Travis CI	Extremely simple CI/CD orchestration tool. Some specialty features for libraries and packages. Free for open-source projects.
GitLab	GitLab	Complete set of development tools including git repositories and built-in, integrated CI/CD pipelines. 2000 free minutes of CI/CD jobs per month.

Monitoring

Monitoring Tools

Data Aggregator	Details	Visualizers
Graphite	Mature, Open-Source, Installable	<i>Grafana</i>
Loggly	Managed, Cloud-Based, Powerful tooling	<i>Built-In</i>
Datadog	Managed, Cloud-Based, Built-in AI/ML	<i>Built-In</i>
Prometheus	Open Source, Lightweight, Self-Contained, Installable	<i>Grafana</i>
Logstash	Open Source, Cloud-Based or Installable	<i>Kibana</i>
CloudWatch	Built-In to AWS	<i>Built-In</i>

Exporters Abound



Prometheus Works with Lots of Different Data Sources!

Reference

- Udacity - Cloud DevOps Engineer Nanodegree Program – Build CI/CD Pipelines, Monitoring & Logging