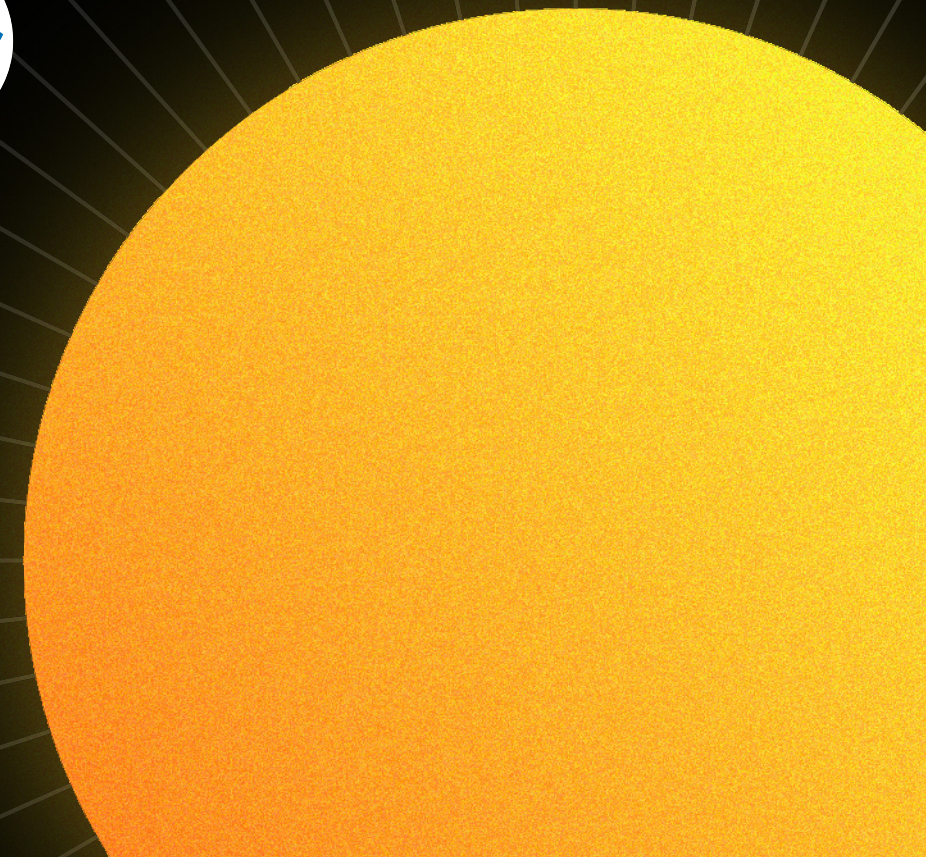
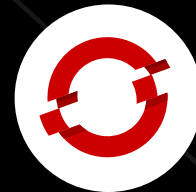


GUIDE

# CI/CD Tools Universe: The Ultimate List

PLUTORA®



Collaborative Tools

<b>Application Lifecycle Management</b>	4
Trello	5
Visual Studio	5
Basecamp	5
Asana	6
Jira	6
Pivotal Tracker	6
Phabricator	7
VersionOne	7
Aha! Software	7
<b>Communication / ChatOps</b>	8
Slack	9
Microsoft Teams	9
Mattermost	9
Ryver	9
Rocket.chat	9
Flowdock	9
IRC	10
Gitter	10
Hubot	10
Lita	10
<b>Knowledge Sharing</b>	11
Read the Docs	12
GitHub Pages	12
Confluence	12
Hugo	12
Jekyll	12
Knowmax	12
Graphviz	13
Flarum	13
RAML	13
OpenAPI	13
API Blueprint	13
Discourse	13

Build Tools

<b>Version Control</b>	14
Git	15
Bitbucket	15
GitLab	15
Subversion	15
Mercurial	15
GitBucket	15
GitHub	16
Gogs	16
Kallithea	16
Beanstalk	16
<b>Continuous Integration</b>	17
Jenkins	18
CircleCI	18
Travis CI	18
DeployPlace	18
Codeship	19
Bamboo	19
TeamCity	19
Drone	20
GoCD	20
Wercker	20
Semaphore	20
Buddy	20
<b>Software Build</b>	21
Docker	22
Ant	22
Maven	22
Gradle	23
Gulp	23
Grunt	23
SBT	24
Packer	24
NAnt	24
Leiningen	24

<b>Database Management</b>	25
Redgate	26
DBmaestro	26
MongoDB	26
Liquibase	26
MySQL	26
Flyway	26
dbForge Studio	27
<b>Test Tools</b>	
<b>Testing</b>	28
Selenium	29
Cucumber	29
OWASP ZAP	29
Jmeter	30
BlazeMeter	30
Jasmine	30
Mocha	30
Junit	30
JUnit	30
QUnit	31
TestNG	31
Rspec	31
Load Impact	31
BrowserSync	31
Gatling	32
SpecFlow	32
FitNesse	32
Serverspec	32
Gauntlt	32
Pally	32
pytest	33
Karma	33
CheckMarx	33
Threatmodeler	33
Katalon Studio	34
SoapUI	34
Ranorex Studio	34

Deploy Tools

<b>Deployment</b>	35
Octopus Deploy	36
Spinnaker	36
XL Deploy	36
UrbanCode	36
Rundeck	36
Juju	37
Capistrano	37
<b>Configuration Management</b>	38
Vagrant	39
Terraform	39
Puppet	39
Ansible	39
Chef	40
SaltStack	40
CFEngine	40
Rudder	40
<b>Artifacts Management</b>	41
Docker	42
npm	42
PyPI	42
JFrog Artifactory	43
Yarn	43
Nexus	43
Archiva	44
NuGet	44
Quay	44
CloudRepo	45
MyGet	45

Run Tools

<b>IaaS / Cloud</b>	46
AWS	47
Google Cloud	47
Azure	47
Rackspace	47
Heroku	47
OpenShift	48
OpenStack	48
Cloud Foundry	48
Engine Yard	48
Flynn	48
Dokku	49
Morpheus	49
<b>Orchestration / Scheduling</b>	50
Kubernetes	51
Mesosphere	51
Rancher	51
Nomad	51
Marathon	51

<b>BI / Monitoring / Logging</b>	52
Google Analytics	53
Kibana	53
Elasticsearch	53
Logstash	53
Airbrake	53
Splunk	54
New Relic	54
Prometheus	54
Pingdom	55
Raygun	55
Zabbix	55
Grafana	56
Dynatrace	56
Nagios	56
Datadog	57
App Dynamics	57
PagerDuty	57
Rollbar	57
Graphite	57
Opsgenie	58
Runscope	58
Beats	58
Moogsoft	58
Zipkin	58
Riemann	58
Atlas	59
Grok	59
APIMetrics	59
Vizceral	59
Sentry	59

# An Introduction to the CI/CD Tools Universe...

As the fastest way to production, the CI/CD pipeline is now mainstream among software companies, forming the backbone of the modern DevOps environment. While DevOps handles the culture aspect, CI/CD focuses on the process and tools.

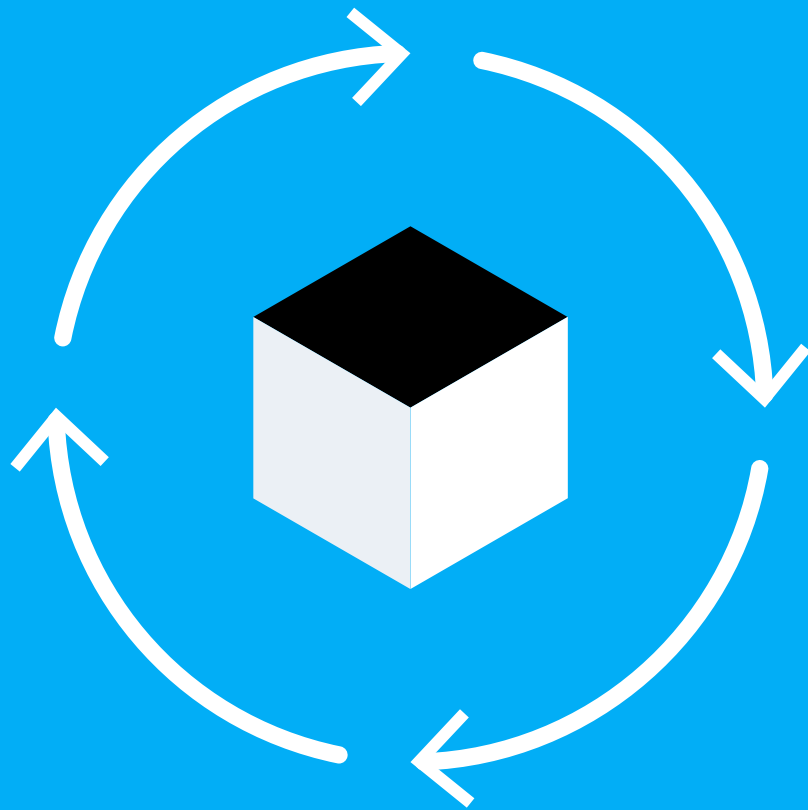
Within the last few years, containerization and microservices have changed the CI/CD game. Looking forward, it will become more and more crucial for vendors to add support for tools like Docker and Kubernetes. Vendors in the CI space must also evolve to include CD, since it is a natural extension of CI capabilities.

With this guide, we hope to provide a clear overview of the various CI/CD tools categories and give a broad sampling of the various tools that are available.

# Application Lifecycle Management Tools

With the increasing speed and frequency of software delivery cycles, businesses need a way to effectively manage their software from beginning to end. Application lifecycle management (ALM) addresses that need, overseeing the continuous process of managing the life of an application from initial idea to eventual retirement. It is a superset of SDLC, as SDLC only covers the development phase.

ALM helps organizations to deliver quality releases faster, with compliance and visibility. It also provides an integrated system for development, which improves communication and helps to align IT with business objectives. Many ALM tools have features like version control and real-time planning, which assist team leaders in making decisions and creating a roadmap for the future.







### **Trello**

Trello is a simple and intuitive web-based project management application that prioritizes lightweight functionality and accessibility over a broad feature set. It organizes projects into Kanban boards that allow you to see, at a glance, whether the various tasks are planned, in progress, or done.

Trello is very versatile and can be used for anything from agile software development to personal tasks; however, it does not provide any reporting or analytics, and is not suitable for high-level management.

Trello's free service comes with unlimited boards, lists, and cards, and allows for any number of collaborators. Limited power-ups are also available for extended functionality.



### **Visual Studio**

Microsoft Visual Studio is a powerful integrated development environment (IDE) for Microsoft Windows, providing comprehensive facilities to programmers for software development. It is used to view and edit code, and then debug, build, and publish apps.

Visual Studio uses Microsoft software development platforms such as Windows API, Windows Forms, Windows Presentation Foundation, Windows Store and Microsoft Silverlight. It is thoughtfully designed, has a huge feature set, and supports a wide range of languages. It comes with built-in language support for C, C++ and C++/CLI, Visual Basic .NET, C#, and F#.

Microsoft also provides a free version of Visual Studio called the Community Edition.



### **Basecamp**

Formerly known as 37signals, Basecamp is a cloud collaboration tool for keeping track of priorities and actionable items. It provides a simple interface for users to manage projects, teams, and schedules, with features like to-do lists, calendars, message boards, file sharing, and chat. It shines when used to share project progress and milestones with clients due to its approachability and ease of use.



### Asana

Similar to Jira and Trello, Asana is a flexible and lightweight project management tool that facilitates communication among teams by managing tasks and workflows. It has an approachable to-do list structure with additional features like a calendar, project timeline, work reporting, goal completion tracking, notifications, and kanban boards.

While Jira is specifically targeted towards IT, Asana is more generic in nature and therefore more versatile. Its thoughtful design and intuitive interface make it especially appealing for marketing and business teams.

Asana integrates with a wide range of SaaS tools, including Gmail, Slack, Microsoft Outlook, Dropbox, Box, Google Drive, and Zendesk.



### Jira

JIRA Software by Atlassian is a project and issue tracking tool that allows you to track any unit of work (such as bugs, tasks, and stories) through a predefined workflow. It is commonly used for software development, feature implementation, bug tracking, service desk ticket tracking, and agile project management.

JIRA features customizable scrum boards, Kanban boards, out-of-the-box reports that offer insight into team performance sprint over sprint, and a configurable dashboard that allows for real-time tracking.

Aside from its versatility, JIRA is appealing for its sprawling ecosystem of add-ons and integrations. It boasts over 50,000 customers, some of which include Twitter, PayPal, and Salesforce.



### Pivotal Tracker

Pivotal Tracker is a web-based agile project management tool that is used almost exclusively for Scrum development. It has points built into stories and provides burnup, burndown, and velocity charts out-of-the-box. It allows developers to collaborate in real time around a shared, prioritized backlog, with features that include automatic planning, multi-project workspaces and performance analytics. It can also be used for issue tracking.

Pivotal Tracker is inflexible in the sense that it is not easy to customize, but it has a large pool of integrations that extend its functionality. It's best suited for big development teams with well-established processes.

# Phacility

## Phabricator

Phabricator is an open source software development platform written in PHP. Its applications include the Differential code review tool, Diffusion repository browser, Herald change monitoring tool, Maniphest bug tracker, Phriction wiki, Conpherence chat, and Conduit API. You can download and install it on your own hardware for free, or launch a hosted instance that gives access to automatic updates, maintenance, and support.

It's fast, scales well, and is best suited for large projects with multiple repositories. While the UI has been criticized for being unintuitive, it is customizable and can be tailored to your specific team.



## VersionOne

VersionOne is an enterprise-level agile ALM solution offered by CollabNet. It is particularly useful for large organizations looking to implement Scaled Agile Framework (SAFe) and is available in four packages: Team, Catalyst, Enterprise, and Ultimate. While it excels in reporting and tracking and has great tools for scrum masters, it can be slow, lacks the customization of other comparable software, and has a clumsy user interface.

# Aha!

## Aha! Software

Aha! is a cloud-based project management tool that supports agile and scrum workflows. It allows users to create product, technology, consulting, manufacturing and marketing roadmaps. Primary features include task lists, product roadmaps, Kanban boards, collaboration and analytics. With Aha! it's easy to rank different features, see them on a Gantt chart, and figure out the strategy for a release of multiple features, all while keeping key stakeholders in the loop.

Aha! is a full-featured and complex product, and as such, has a bit of a learning curve. However, support for the product is generally considered to be helpful and responsive.

# Communications & ChatOps Tools



ChatOps is conversation-driven collaboration using chat clients, chatbots, and real-time communication tools. It is widely used by DevOps teams to work with more transparency, efficiency, and speed.

ChatOps provides a real-time and historical log of work activities, which supports compliance and security. It also reduces human error by automating repetitive manual tasks. For example, team members can type commands to chatbots that then execute actions like code deployments, event responses, and notifications.

ChatOps aims to increase visibility across the board, so that all actions are taken in full view of the team. It is especially useful for remote workers and new hires.





### Slack

Slack is an incredibly popular messaging app that also enables users to make voice or video calls, screen share, and swap files. Conversations can be searched, archived, and organized into channels for specific teams. It is known for being especially easy to setup, deploy, and use. Because of its many integrations, it often serves as the central hub for business activities and is referred to as the “water cooler” of the office.



### Microsoft Teams

Microsoft Teams is a platform that combines workplace chat, meetings, notes, and attachments. If you possess a Business account already and frequently work on Office 365 integrated applications, Microsoft Teams is likely to be a good choice.



### Mattermost

Mattermost is an open source Slack alternative written in Go that is designed to facilitate team communication. Since it is self-hosted, organizations can use one account across multiple teams. Mattermost will also work as long as the local network is running — even if the internet goes down



### Ryver

Ryver is a cloud-based Slack alternative that combines team communications and task management. Users can collaborate via chat, then translate those conversations into assignable tasks, checklists, and task boards.

Since Ryver is cloud hosted, there may be some concerns with data security. Ryver also does not support indexing, so it can be difficult to search through message histories.



### Rocket.chat

Rocket.chat is a free and open source team communication application made in Meteor. With it, organizations can host chats on their own servers, thereby retaining complete control over their data. It offers messaging, audio and video conferencing, screen sharing, file sharing, real-time translation, and live chat, which can be used to answer customer queries and convert leads.



### Flowdock

CA Flowdock integrates conversations, emails, feeds, alerts, pull requests and notifications into a single dashboard. It offers threaded chat, notifications, and threads can also be searched and tagged for easy filtering. Flowdock has a rich feature set and targets enterprise customers.



## IRC

Internet Relay Chat (IRC) is a no-frills text based chat system that was developed in the 1990s and requires client/server software to run.

It is mainly designed for group communication, which takes place in chatrooms and is overseen by operators. Operators are users that have privileged access and can disconnect or ban other users.

IRC is particularly popular among developers and other technically savvy individuals. It is simple and highly extensible, requires very little bandwidth, and runs on low speeds. In addition, many IRC networks have IP cloaking and allow for connections from Tor nodes, VPNs, and proxies.



## Gitter

Gitter is an open-source instant messaging and chat room system written in JavaScript. It is similar to Slack, but designed for individuals (specifically developers and GitHub users) instead of businesses. For an example, you don't need to create an account for Gitter -- you can simply login with your Twitter or GitHub account. Individual chat rooms can also be created for individual git repositories on GitHub. The free option allows for the creation of a single private chat room, with all basic features enabled, while the paid subscription allows for the creation of multiple chat rooms.



## Hubot

Hubot is an open source, scriptable chat bot written in CoffeeScript on Node.js. Once synced with other chat services, it can be used to automate tasks, deploy code, post images, translate languages, and much more.



## Lita

Lita is a free and open source chat bot written in Ruby. It works with chat services like IRC, Hip Chat, and Campfire, and can be extended with various plugins. Its primary function is to automate tasks.

# Knowledge Sharing Tools



Knowledge sharing is the act of exchanging information, skills, and expertise between individuals, teams, communities, or organisations. This can be supported by knowledge management systems or knowledge repositories.

Knowledge sharing is difficult to measure, yet it is critical to the success of any organization and results in better business outcomes. It can be enabled via technological means with content management systems like intranets and wikis, but should also be supplemented by a positive workplace culture that provides incentives for sharing.



### Read the Docs

Read the Docs simplifies software documentation by automating the building, versioning, and hosting of documents. It is free and supports multiple versions.

## GitHub Pages

### GitHub Pages

GitHub Pages is a free static site hosting service that allows developers to turn their GitHub repositories into websites to showcase their portfolios, projects, and documentation. It uses Jekyll as its static site generator.

GitHub Pages has a powerful web editor that allows users to create and edit files from the web browser, essentially replicating the function of a simple content management system.



### Confluence

Confluence by Atlassian is content collaboration software that works in conjunction with Jira and other Atlassian products. It often serves as a knowledge base or wiki for Jira projects, but can also be used for general purpose activities like keeping meeting minutes, sharing assets, and storing files. Features include document management, pre-built templates, and file versioning.



### Hugo

Hugo is an open source static site generator that prioritizes speed, ease of use, and easy configuration. It features robust content management, shortcodes, built-in templates, and allows for custom outputs like JSON or AMP.



### Jekyll

Jekyll is a simple, blog-aware static site generator built on Ruby. It is also the engine behind GitHub Pages. While similar to Hugo, Jekyll is the more flexible and beginner-friendly tool. Its built-in functionality is basic, but can be augmented by a variety of third-party plugins that allow you to create menus, generate sitemaps, and more. Migrating from WordPress is made easy with a well-supported WordPress importer. However, it is markedly slower than Hugo.



### Knowmax

Knowmax is a knowledge management tool for enterprises that provides better customer service at digital as well as assisted channels. Its features include decision trees, visual how-to guides, chatbots, and analytical insights.



### Graphviz

Graphviz is open source graph visualization software. It takes descriptions of graphs in a simple text language and outputs diagrams in useful formats like SVG and PDF. It has many useful features for concrete diagrams, such as options for colors, fonts, tabular node layouts, line styles, hyperlinks, and custom shapes.



### Flarum

Flarum is a free, open source PHP forum system. It is fully responsive and touch optimized, with a streamlined two-pane interface for a better user experience. Its features include infinite scrolling, customizable color themes, moderation tools, and search. Flarum is modern and lightweight, with quick load times. However, it is still in beta and should not be used in production.



### RAML

RESTful API Modeling Language (RAML) is a YAML-based modeling language to describe RESTful APIs. It is easier to read and understand than other formats like XML or JSON. RAML can be used to implement interactive API consoles, generate documentation, describe an API you are planning to build, and more.



### OpenAPI

The OpenAPI Initiative (OAI) is an open governance structure under the Linux Foundation. It focuses on creating, evolving, and promoting a vendor-neutral description format for API services. While RAML has emerged as the leading way to model API specifications, OpenAPI has emerged as the most common format for describing APIs.



### API Blueprint

API Blueprint is an open source high-level API description language for web APIs. It can be used to quickly design and prototype APIs to be created, or document and test already deployed APIs. Its syntax, which is similar to Markdown, makes it easier to describe REST APIs.



### Discourse

Discourse is open source modern forum software written with Ember.js and Ruby on Rails. It can be used as a mailing list, discussion forum, and long-form chat room. Its features include infinite scrolling, live updates, expanding links, drag and drop attachments, tags, groups, and more. While Slack excels at real-time chat, Discourse makes it easier to see past conversations and access evergreen content.



# Version Control Tools



Source code is an invaluable resource that provides precious context, knowledge, and understanding for any given project. As such, it must be protected and preserved. Since source code is constantly being written and modified by various developers, it's easy for different versions to sprawl out of control, which can lead to bugs and incompatibility.

This is where version control tools come in, providing an organized way to track changes over time. They record changes so that specific versions can be recalled later, synchronize versions to make sure that team members don't make different code changes, and provide process enforcement and permissions. Version control is absolutely essential for modern software development, regardless of the size of the project.



### Git

Git is a free, open source distributed version control system (DVCS) used for software development version tracking and work coordination. In a DVCS, every contributor has a local copy of the central repository. This means that operations execute faster, committing new changes can be done locally, and contributors can gather feedback before pushing to the main repository. Some users feel that Git's commands are unintuitive and difficult to learn. However, it is the most well-known VCS in the world and therefore the default choice for many developers and businesses.



### GitLab

GitLab is an open source web-based Git repository manager written in Ruby on Rails. It is very similar to GitHub in look and feel, with features for a wiki, issue tracking, user permissions, and support for pull requests and protected branches. It also comes with an integrated CI/CD solution, GitLab CI. While flexible and scalable, GitHub can also be slow and consumes a lot of resources.



### Subversion

Apache Subversion (SVN) is a free, open source non-distributed version control system for tracking changes to files, folders, and directories. It is better than Git at storing binary files, but its branching model is less efficient. SVN is also considered to be easier to learn than Git.



### Mercurial

Mercurial is a free, distributed source control management tool designed for efficient handling of very large distributed projects. It provides anyone who clones a repository with a standalone, fully functional local repository containing the full development history and the ability to select any version of the code. It is similar to Git, but Mercurial is generally considered to be simpler and easier to learn.



### GitBucket

GitBucket is an easily installable Git platform written with Scala. It has a GitHub-like user interface, with features like Git repository hosting via HTTP and SSH, repository viewer, issues, user management, wiki, and plugin system. GitBucket supports both public and private repositories.



### GitHub

GitHub is a web-based version control and collaboration platform for developers. It facilitates social coding by providing a web interface for Git's code repository, collaboration tools, wikis, and task management tools for projects.



### Gogs

Gogs is an open source, self-hosted Git service written in Go. It provides services similar to GitHub, but with several differentiating features, such as a very low memory footprint, fewer requirements and the ability to compile code into a single binary.



### Kallithea

Kallithea is open-source donationware under the Software Freedom Conservancy project that focuses on providing a customized, self-administered interface for Mercurial and Git repositories. It is built for speed and performance with a built-in push/pull server, full text search and code-review, and can be run as standalone hosted application on your own server.

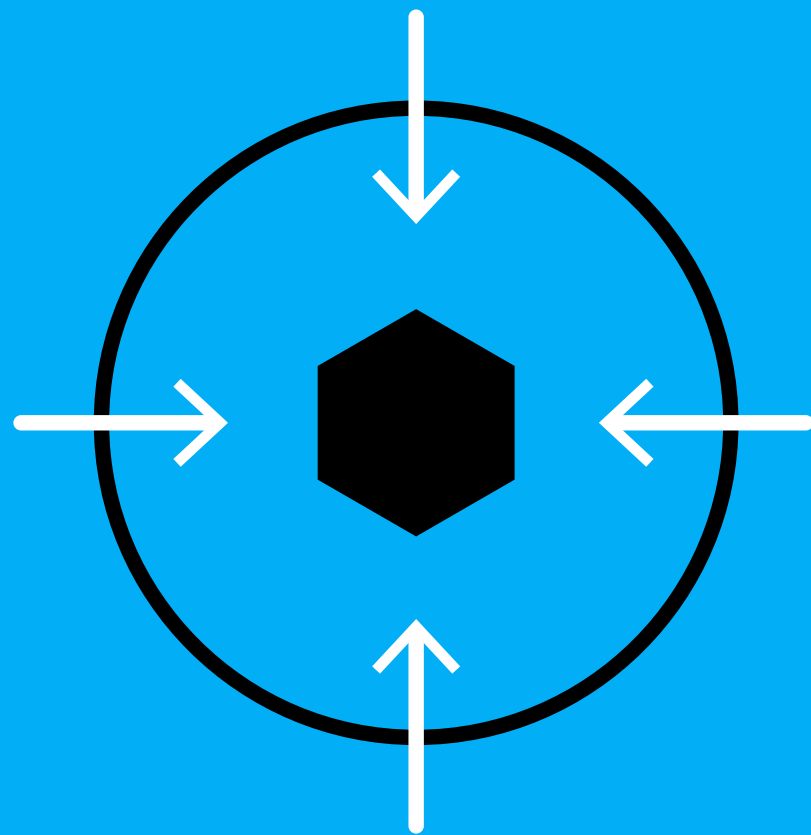
The name originates from Kallithea, the name of a locality on the island of Rhodes, in Greece, which means 'the best view'. In turn, the Kallithea project helps developers get the best views of their project and its contributions.



### Beanstalk

Beanstalk by Wildbit is an all-in-one tool that allows users to code, commit, review and deploy using a browser. It is easy to set up, supports both Git and SVN, has a versatile deployment system, and comes with built-in analytics features. However, it is less comprehensive than tools like GitHub and Bitbucket, and lacks a wiki.

# Continuous Integration Tools



Together, continuous integration (CI) and continuous delivery (CD) form the foundation of the modern DevOps environment, and understanding them both is crucial for keeping up in today's software-driven world.

CI tools allow developers to merge code into a shared central repository regularly. The tools automatically build and test the code, keeping it in a perpetually deployable state.

This allows teams to find and address bugs quicker, improve software quality, and deliver updates faster. Team members can work independently on different features of the same project while continually testing that everything still works. Ultimately, this provides a predictable way to complete tasks while meeting deadlines, improving the relationship between IT and the business.



### Jenkins

Jenkins is a general purpose, open source automation server written in Java. It is used to continuously build and test software projects, enabling developers to set up a CI/CD environment. It also supports version control tools like Subversion, Git, Mercurial, and Maven.

Jenkins is well-documented and extremely extensible, with a vast ecosystem of plugins and integrations. For that reason, it shines when used in large projects that require lots of customization.

While Jenkins itself is free, it must be run on a server which will require attention, updates, and maintenance. Jenkins is relatively hard to setup and manage, but compensates with flexibility and power.



### Travis CI

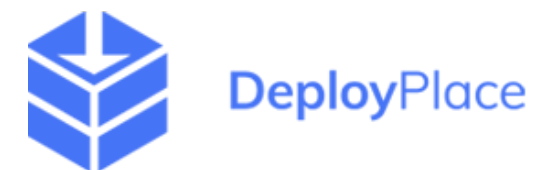
Travis CI is an open source, hosted continuous integration and delivery service used to build and test GitHub projects. It is easy to configure with a lightweight YAML file, has a wide ecosystem of integrations, and is free for public projects. Travis CI also handles and maintains hosting servers so that you don't have to. It is virtually identical to CircleCI, but with some minor differences.

Compared to CircleCI, its main advantages are that it can run tests on Linux and Mac at the same time, supports more languages out of the box, and has a build matrix which allows you to run tests with different versions of languages and packages. It is also free for all public repositories on GitHub. In some cases, Travis CI has been criticized for slow provisioning time, instability, and an unintuitive UI.



### CircleCI

CircleCI is a lightweight cloud-based continuous integration and delivery platform that automates build, test and deployment processes. It supports Ruby on Rails, Sinatra, Node, Python, PHP, Java, and Clojure. CircleCI has an easily readable YAML configuration, is painless to setup, and does not require a dedicated server to run. It is suitable for small projects that need to get off the ground quickly.



### DeployPlace

DeployPlace is a transparent deployment tool by developers for developers, with the possibility to easily deploy complex applications, as well as static websites or client-side projects directly from your CI. Supports Cloud Providers (AWS, DigitalOcean, Azure, Google Cloud) as well as its own set of Internet-enabled hardware as deployment target.





### Codeship

Codeship by CloudBees is a hosted continuous delivery platform. It helps to release software quickly, automatically and multiple times a day. It integrates with GitHub and BitBucket, automatically deploying when tests pass and notifying you when tests or deployments have failed.

Codeship has a free plan with unlimited users and projects, but if you want native Docker support or parallel pushes, you will have to upgrade.

It is quick and simple to get started with, with an intuitive user interface that is easy to understand and use.



### Bamboo

Bamboo is a commercial continuous integration server that is free for open source projects. It is used to automate the release management for software applications, creating a continuous delivery pipeline. It has built-in Git Branching workflows and deployment projects, as well as native integrations with other Atlassian tools, such as Jira and Hipchat.

Atlassian discontinued Bamboo Cloud in 2017, replacing it with Bitbucket Pipelines for cloud hosting. Some users feel that this replacement is imperfect, leaving gaps in features and support.

If you are invested in the Atlassian tech stack and don't mind paying for your continuous integration solution, Bamboo might be the right tool for you.



### TeamCity

TeamCity by JetBrains is a commercial, Java-based build management and continuous integration server. It has a robust set of out-of-the-box features, including VCS interoperability, build history, source control, code quality tracking, and user management, and provides a browser-based dashboard that provides project status and reporting information. It is known for its ease of setup, usability, and appealing user interface.

TeamCity is a powerful, up-and-coming alternative to Jenkins. Its Professional server is free for up to 20 build configurations.



### Semaphore

Semaphore is a hosted continuous integration and deployment platform for both open source and private projects. While open source projects can use Semaphore for free, private projects are limited or must be paid for on a subscription basis.

Features of the platform include native Docker support, customizable stages, parallel execution, control flow switches, secrets and dependency management.

Compared to other continuous integration tools, Semaphore chooses to focus on performance and advertises itself as being twice as fast as its competitors. Its strengths include: easy setup, a clean and simple interface, and responsive support.



### Drone

Drone is a simple and open source CI/CD platform that was developed primarily as an alternative to self-hosted Jenkins. It is built on Docker and written in Go. Its syntax is designed to be easy to read and expressive, so that anyone using the repository can understand the continuous delivery process. One of Drone's key features is its native integration with Kubernetes.



### GoCD

GoCD by ThoughtWorks is an open source continuous delivery tool that aims to support the most common CD scenarios out of the box, rather than using plugins. Its features include value stream mapping, cloud native deployments, complex workflow modeling, and advanced traceability. It also has native integrations for Kubernetes.



### Buddy

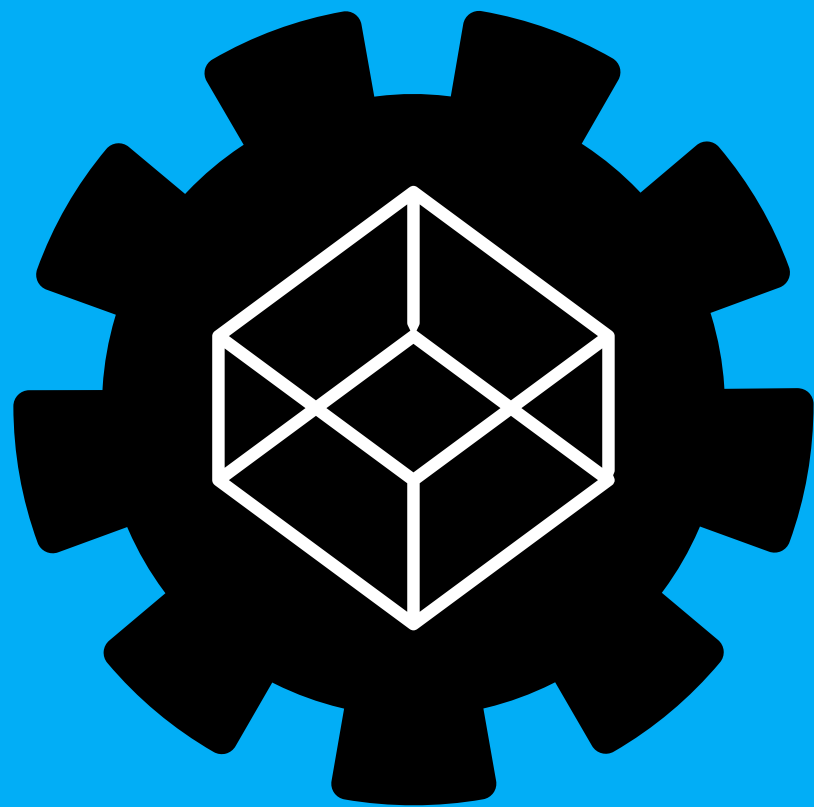
Initially launched as a downloadable virtual machine under the name Meat!, Buddy is a web-based and self-hosted continuous integration and delivery tool for Git developers that can be used to build, test and deploy websites and applications. Its features include: Docker layer caching, concurrent pipelines & steps, vCPU and RAM scaling, reusable environments, repository caching, artifacts caching, and changeset-based deployments.



### Wercker

Wercker, bought by Oracle in 2017, is a Docker-based CI/CD developer automation platform that helps developers build, test and deploy containerized applications and microservices.

# Software Build Tools



Software build tools are used to create automated builds from source code. They script or automate a variety of tedious or repetitive tasks, such as downloading dependencies, compiling and packaging code, running tests, deployment, and generating documentation. They also allow you to build your project with the click of a button, which reduces errors from manually running steps.

Build automation tools are crucial for moving towards a continuous delivery (CD) model, and are especially important in environments with many concurrent projects. Speed, community presence, and versatility are all important qualities to keep in mind when evaluating build tools.



### Docker

Docker is a software container platform. Originally released in 2013 as an open source Docker Engine, it has grown enormously in popularity and now has an integral place in most DevOps toolchains. It enables developers to easily pack, ship, and run any application as a lightweight, portable, self-sufficient container, which can run almost anywhere. This eliminates “works on my machine” problems when collaborating on code, ensuring that applications work seamlessly in any environment.

Docker containers are the preferred replacement for Virtual Machines (VMs), given that they boot faster, perform better, and consume less memory resources. Docker Containers are also able to share a single kernel and share application libraries.



### Ant

Apache Ant is one of the more venerable Java-based build automation tools, originating from the Apache Tomcat project in 2000. Its strengths are portability, flexibility, and simplicity. It does not impose coding conventions or project structures, and its build files can easily be transferred to other platforms because they inherit the Java platform’s independence. By the same token, Ant files can be difficult to understand and grasp immediately.

Ant does not have built-in support for dependency management; rather, Ant’s dependency management is handled by Apache Ivy, a sub-project that integrates with Ant.



### Maven

Apache Maven is a dependency management and build automation tool from the Apache Software Foundation. Based on the concept of a project object model (POM), Maven can manage a project’s build, reporting and documentation from a central piece of information. It uses XML to configure projects and Java to write extensions.

Maven emerged as a result of various frustrations with Ant. Like Ant, it uses XML for project configuration, but with more conventions and predefined commands that provide a framework in which to work. It also has built-in dependency management, which Ant lacks.



### Gradle

Gradle Build Tool is an open source build automation system designed for multi-project builds. It supports Maven and Ivy repositories for retrieving dependencies so that you can reuse artifacts of existing build systems.

Essentially, Gradle was built to combine the best parts of established tools like Ant and Maven, but with a Groovy-based Domain Specific Language (DSL) instead of XML for declaring project configuration. DSL tends to be easier to read, more succinct, and also more powerful.

Gradle is the official build tool for Android Studio.



### Gulp

Gulp is a JavaScript task runner that automates painful or time-consuming tasks in your development workflow, such as: bundling and minifying libraries and stylesheets, running unit tests, and running code analysis.

Gulp allows you to check for new or modified files, and then run tasks applicable to those files. This means that once you setup processes for existing files, you can have those processes automatically applied to new or modified files as well. This makes it faster and easier to keep large batches of files up to date. Gulp is commonly used to compress image files, run unit tests, batch renaming files, update databases, etc.

Gulp's purpose and features are very similar to those of Grunt; however, it prioritizes code over configuration and is generally faster and easier to read.



### Grunt

Grunt is a JavaScript task runner that automates repetitive tasks like minification, compilation, unit testing, and linting. It also has a large ecosystem of plugins that extend base functionality.

Grunt is slower than Gulp, but has its advantages for certain use cases.





### SBT

Simple Build Tool (SBT) by Scala is an open-source build tool for Java and Scala projects. It is the default build tool for Scala programming, with features that include incremental compilation and an interactive shell. It provides native support for compiling Scala code, integrates with many Scala test frameworks, and automatically manages dependencies.



### Packer

HashiCorp Packer is a free and open source tool for creating identical machine images for multiple platforms from a single source configuration. Its advantages include: faster infrastructure deployment, multi-provider portability, improved stability, and greater testability.



### NAnt

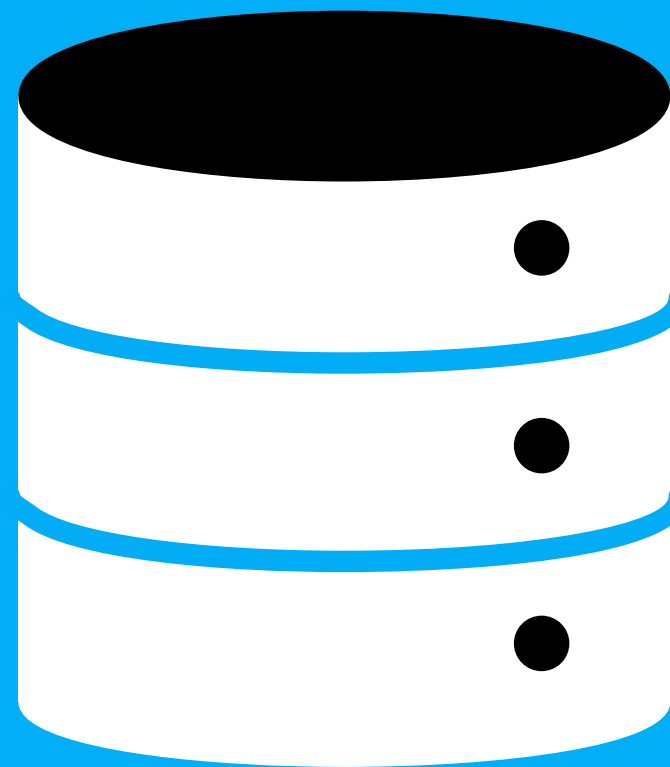
NAnt is a free and open source build automation tool similar to Apache Ant, but targeted at the .NET environment instead of Java. It can perform tasks such as compiling source code and resource files into assemblies, running unit tests, configuring build-specific settings, and more.



### Leiningen

Leiningen is a build tool for Clojure. It serves as an adapter between the command line and Clojure, making it easier for you to run Clojure functions.

# Database Management Tools



Whether you're ordering an item online, booking an airline ticket, or liking a social media post, that activity will generate data that has to be stored in a database.

On the most basic level, database management tools provide a framework for organizations to store and process that data efficiently. They aim to control data throughout its entire lifecycle, providing a systematic and secure way to create, retrieve, update and manage data. Features of a database management tool might include application tuning, response time testing, and throughput testing.

From a business perspective, database management tools can help to manage application performance, increase compliance, and measure growth.



### Redgate

Redgate Software makes tools for professionals working on the Microsoft data platform. It produces specialized database management tools for Microsoft SQL Server, Oracle, MySQL and Microsoft Azure. It also makes advanced developer tools for .NET Framework, such as SmartAssembly and .NET Reflector.



### DBmaestro

DBmaestro is a DevOps for database solution provider. DBmaestro's solutions enable organizations to run database deployments safely and methodically, increase development team productivity and expedite time-to-market. These solutions include release automation, version control, security and governance and business activity monitoring.



### MongoDB

MongoDB is an open-source, non-relational (NoSQL) distributed database written in C++. It is document-based, which means that it stores data in rich JSON documents. The advantages of MongoDB, and of NoSQL in general are its dynamic schema, scalability, manageability, speed, and flexibility. It is a strong choice for businesses that are experiencing rapid growth, and is often used for Node.js projects as well.



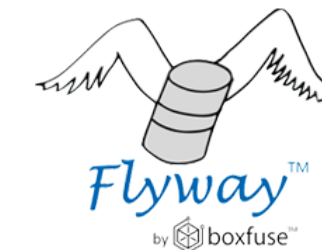
### Liquibase

Liquibase by Datical is an open source, database-independent library for tracking, managing and applying database schema changes. It provides a schema changelog that allows you to roll changes back and forward from a specific point.



### MySQL

MySQL is an open-source relational database management system (RDBMS) owned by Oracle. MySQL is compatible with nearly all operating systems and supports various storage engines, but it can be slow and has trouble with large data volumes. It is the de-facto solution for enterprises worldwide.



### Flyway

Flyway by Boxfuse is an open source database migration tool. It prioritizes simplicity and is based around just 7 basic commands: Migrate, Clean, Info, Validate, Undo, Baseline and Repair. Migrations can be written in SQL or Java.



### **dbForge Studio for SQL Server**

dbForge Studio for SQL Server is a powerful IDE for Microsoft SQL Server management, administration, development, data reporting, analysis, and more.

SQL developers and DBAs performing complex database tasks can use the GUI tool to speed up almost any database experience, such as designing databases, writing SQL code, comparing databases, synchronizing schemas and data, generating meaningful test data, and much more.

There is no need to waste time searching for or purchasing SSMS plug-ins across the Internet to get your work done – dbForge Studio for SQL Server has everything you need to set up your SQL development environment.

# Testing Tools



In the software development life cycle (SDLC), testing is the phase where developers check whether the software satisfies the specific requirements, needs, and expectations of the customer by testing for bugs, defects, and errors. Testing tools help testers to find issues in their products before the users do, ultimately resulting in better quality software.

There are many types of testing, some of which include unit testing, integration testing, load testing, and usability testing. Some tools focus on just one category, while others provide comprehensive coverage.

Within the testing sphere, shift-left and automation are becoming increasingly important. Looking ahead to the future, artificial intelligence (AI) and machine learning (ML) may play a key role by allowing organizations to automate even further.





### Selenium

Selenium is the leading test automation solution for web applications. It is both free and open source, and consists of a set of software tools - WebDriver, RC, Grid, and IDE. The Selenium IDE provides a playback tool for authoring tests without the need to learn a test scripting language. It also provides a test domain-specific language (Selenese) to write tests in a number of popular programming languages, including C#, Groovy, Java, Perl, PHP, Python, Ruby and Scala. Selenium deploys on Windows, Linux, and macOS.

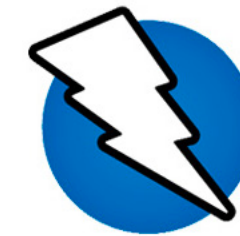
Selenium is considered to be easy to implement, and it aims to make testing more reliable and repeatable.



### Cucumber

Cucumber is an open source collaborative tool for executable specifications. It runs automated acceptance tests in a behavior-driven development (BDD) style. With Cucumber, the requirements specifications, tests and documentation are all the same documents, providing a single source of truth for the whole team.

Cucumber uses the plain text Gherkin syntax to define test cases, which is more approachable for non-technical team members and useful for documenting stories. It also allows you to reuse code more easily, ultimately reducing the amount of code that has to be written.



### OWASP ZAP

Zed Attack Proxy (ZAP) is one of the world's most popular web application security testing tools. It is a free tool that is actively maintained by volunteers under the Open Web Application Security Project (OWASP) and has a large community of developers creating additional modules.

ZAP automatically finds security vulnerabilities in your web applications while you are developing and testing your applications. It can be used as a man-in-the-middle between browser and app server, as a standalone application, or as a daemon process without UI. Its features include AJAX spidering, fuzzing, websocket testing, and flexible scan policy management. It is highly scriptable and supports multiple scripting languages, including Javascript, Zest, Python, Groovy and Ruby.



### Jmeter

Apache JMeter is an open source Java application from the Apache Software Foundation. It is designed to load test functional behavior and measure performance on a variety of services, with a focus on web applications. JMeter's strengths are a great user interface, pluggable components, and rich HTML reporting.



### BlazeMeter

BlazeMeter is a commercial, self-service load testing platform as a service (PaaS) tool. It is compatible with Apache JMeter and Selenium, and integrates with CI, CD, and APM tools.

It markets itself as 'JMeter in the cloud' and addresses JMeter's limitations concerning scalability, stability, and reporting.



### Jasmine

Jasmine is a behavior-driven development framework for testing JavaScript code. It has easy-to-read syntax and does not rely on browsers, DOM, or any JavaScript framework. Thus it's suited for websites, Node.js projects, or anywhere that JavaScript can run.



### Mocha

Mocha is a popular Node.js testing framework that is commonly used for integration and unit testing. It supports asynchronous testing, is compatible with the major web browsers, provides a variety of reporters, and works in both test driven development (TDD) and behavior driven development (BDD) environments.



### JUnit

JUnit is a unit testing framework for Java. Developers use it to write and run repeatable tests. It belongs to a family of unit testing frameworks which is collectively called xUnit.

JUnit features include assertions for testing expected results, text fixtures for sharing common test data, and test runners.



### NUnit

NUnit is a unit testing framework for all .Net languages. It is similar to JUnit for Java, and is part of a family of related testing frameworks known as xUnit. With NUnit, tests can be run continuously and concurrently, and results are provided immediately.



### QUnit

QUnit is an easy-to-use JavaScript unit testing framework that belongs to a family of related testing frameworks known as xUnit. It's used by the jQuery, jQuery UI and jQuery Mobile projects and is capable of testing any generic JavaScript code.



### TestNG

TestNG is an open source automated testing framework for Java. It is inspired by JUnit and NUnit, but with unique additional features like annotations, flexible code configurations, and support for parameters. It is designed to be more powerful and easy-to-use, while covering a wider range of test categories.



### Rspec

Created in 2005, RSpec is a testing framework for behavior-driven development (BDD) for Ruby. It allows you to conduct Unit, Functional, and Feature tests.

RSpec is composed of multiple libraries, which are designed to work together, or can be used independently with other testing tools. RSpec is often used in tandem with Cucumber, with Cucumber handling the integration testing and RSpec handling the unit testing. In comparison to Cucumber, RSpec is more commonly used for lower-level tests and smaller projects.

Like all Ruby related tools, it is available in the form of the RSpec Ruby gem, which makes it easy to install.



### Load Impact

Load Impact is a cloud-based load testing system that tests applications for scale and performance across regions. It calculates the response rate of every transferred resource, and also measures CPU usage, memory usage, disk I/O and network I/O.



### BrowserSync

Browsersync is a free and open source tool that helps you test faster by synchronizing file changes and interactions in real-time across multiple devices. It also automates tasks, such as the compilation of SASS files, image compression, and form replication.



### Gatling

Gatling is an open source load and performance testing tool based on Scala, Akka, and Netty. Its features include: a standalone HTTP proxy recorder, Scala-based scripting, an expressive self-explanatory DSL for test development, an asynchronous non-blocking engine for maximum performance, and excellent support of HTTP(S) protocols.



### SpecFlow

SpecFlow is an open source testing framework that supports Behaviour Driven Development (BDD). As part of the Cucumber family, SpecFlow uses the official Gherkin parser and supports the .NET framework, Xamarin and Mono.



### FitNesse

FitNesse is a web server, a wiki, and an automated testing tool for software. It enables customers, testers, and programmers to collaborate to create and edit test cases on a wiki. Those wiki pages can then be run as tests. FitNesse is commonly used with JUnit or NUnit, which help to test-drive and refactor your code.



### Serverspec

Serverspec is an infrastructure testing tool for Ruby that allows you to write RSpec tests to check that your server is configured correctly. Tests can also be driven by many of the popular configuration management tools, such as Puppet, Ansible, CFEngine and Itamae.



### GauntIt

GauntIt is a ruggedization framework that enables security testing that is usable by devs, ops and security. It provides attack adapters for curl, nmap, sslyze, and garmr, and also features a generic command line adapter to run any command line tool.



### Pa11y

Pa11y is a free and open source automated accessibility testing tool that runs HTML CodeSniffer from the command line for programmatic accessibility reporting.



### pytest

Pytest is an easy-to-use Python testing tool that doesn't require boilerplate code or an API. Its features include: detailed info on failing assert statements, auto-discovery of test modules and functions, modular fixtures for managing small or parametrized long-lived test resources, and rich plugin architecture.



### Karma

Karma is an open source JavaScript test runner that runs on Node.js. Karma is highly configurable, integrates with popular continuous integration packages (Jenkins, Travis, and Semaphore) and has excellent plugin support.



### CheckMarx

Checkmarx CxSAST is an enterprise application security testing and static code analysis solution that scans source code, identifies security vulnerabilities within it, and provides remediation with sample code. Features include static application security testing, dependency scanning, interactive application security testing, and runtime application security testing.

CheckMarx is flexible, integrates with other popular CI/CD tools, supports a wide range of programming languages, and is a solid option for organizations looking to implement DevSecOps.



### Threatmodeler

ThreatModeler is an enterprise-level automated threat modeling platform that utilizes VAST (Visual, Agile and Simple Threat Modeling) methodology, is PFD-based, and identifies threats based on a customizable comprehensive threat library. It takes a proactive approach to identifying entry points to prevent security breaches in applications and computer systems. Distinguishing features include process flow architecture diagrams, a centralized and customizable threat library, and an intelligent threat engine. Unlike most other threat modeling tools, ThreatModeler has a plethora of cloud-friendly features.



### Katalon Studio

Katalon Studio is a free automation testing tool that is powered by Selenium. It is designed to create and reuse automated test scripts for UI without coding, and allows for the testing of pop-ups, iFrames, wait time, and more.

Compared to Selenium, Katalon is easier to deploy, offers more integrations, and has features for analytics and reporting. It is extremely easy to set up and works immediately out of the box. However, it is not open source and its community is small, so support may be limited.

It is best characterized as an emerging solution that works for small and medium size businesses.



### SoapUI

SoapUI is a free and open-source test automation framework for APIs like SOAP and REST. Its functionality includes web service inspection, invoking, development, simulation and mocking, functional testing, load and compliance testing. It is also offered as a paid pro version, which has advanced features like test history, SQL query builder, and enhanced support.

SoapUI's strengths are its easy setup, well-designed user interface, and breadth of integrations. It is simple to learn and operate even for non-technical users. However, it can be slow and the free version lacks important features like version control.



### Ranorex Studio

Ranorex Studio is a commercial Windows GUI test automation framework used to test desktop, web-based, and mobile applications. It is built on Microsoft's .NET platform, supports programming languages C# and VB.NET, and supports Selenium integration for web application testing. Its key features include easy installation for non-programmers, image recognition, recording and replay, data-driven and keyword-driven tests, cross-platform and device testing, and reports and logs.

Ranorex Studio is a premium, powerful testing tool that is more comprehensive and also more expensive than many other tools in its category. It is a good solution for implementing automated testing in continuous delivery and DevOps environments.



# Deployment Tools

Deployment tools streamline the process of distributing software and updates, usually by scheduling or automation, so that developers can focus on more critical tasks. They also allow developers to collaborate on projects, track progress, and manage changes.

With the explosion of DevOps, continuous deployment (CDE) has become an increasingly popular practice. It involves automatically releasing code that passes the automated testing phase into production, making updates available to users faster and more frequently. For businesses that release on a daily or near-daily basis, CDE is an option that should be considered.





### Octopus Deploy

Octopus Deploy is a user-friendly release management, deployment automation and DevOps solution. It's used to deploy .NET, Java and other applications to test, staging and production environments on-premises or in the cloud.



### Spinnaker

Spinnaker is an open source, multi-cloud continuous delivery platform. It was initially developed internally by Netflix to help development teams release software changes with velocity and confidence. It provides two core sets of features: cluster management and deployment management.



### XL Deploy

XebiaLabs Deploy is an enterprise-scale application release automation solution. It is agentless across all target platforms, meaning that you can easily configure firewalls and security appliances, routers, mobile devices, and all the target systems you would normally have to install a proprietary agent to reach.



### UrbanCode

IBM UrbanCode Deploy is a tool for automating application deployments through your environments. It is designed to facilitate rapid feedback and continuous delivery in agile development while providing the audit trails, versioning and approvals needed in production.



### Rundeck

Rundeck is an open source operations management platform that helps to automate routine operational procedures in data center or cloud environments. It enables you to run tasks on any number of nodes from a web-based or command-line interface. It also provides other features that make it easier to scale scripting efforts, including access control, workflow building, scheduling, logging, and integration with external sources for node and option data.



### Juju

Juju is an open source application and service modeling tool from Ubuntu that helps you deploy, manage and scale your applications on any cloud. With Juju, different authors are able to create service formulas, called charms, independently, and make those services coordinate their communication and configuration through a simple protocol. Juju can also be used together with Orchestra for physical deployments.



### Capistrano

Capistrano is a framework for building automated deployment scripts. It is written in Ruby, but can easily be used to deploy projects of any language or framework, be it Rails, Java, or PHP. It is most commonly used to deploy web applications.

# Configuration Management Tools

The configuration of your computer is in a constant state of flux. From the moment it is taken out of the box, software is added, removed, and updated. At enterprise scale, those types of changes must be made and tracked on hundreds or even thousands of computers.

Software configuration management (SCM) tools control those changes, continuously monitoring and ensuring that organizational infrastructure is configured to the correct specifications. This maintains status quo across server environments, reduces incident resolution time, and helps to prevent surprises.

SCM tools should include features for enforcement, version control, change control, and abstraction, and must also support your existing toolchains and systems.



### Vagrant

HashiCorp Vagrant is an open source tool for building and managing virtual machine environments. It is used in conjunction with tools that try to simplify software configuration management of virtualizations, such as VirtualBox, Docker containers, VMware, and AWS.



### Terraform

Terraform is an open source infrastructure as code tool by HashiCorp. It codifies APIs into declarative configuration files that can be shared amongst team members, treated as code, edited, reviewed, and versioned.



### Puppet

Puppet is a mature open source systems management tool for centralizing and automating configuration management. It provides an automatic way to inspect, deliver, operate and future-proof infrastructure and software, no matter where it runs.

Puppet is commonly used by DevOps organizations, specifically on the operations side, to automate server setup, program installation, and system management.

As the most venerable configuration management solution with the biggest market share, Puppet boasts a huge community of users and a vast module library (known as Puppet Forge). Its sponsor company, PuppetLabs, provides professional support and offers a commercial enterprise version of the software.



ANSIBLE

### Ansible

Ansible by Red Hat is a configuration management and provisioning tool that automates cloud provisioning, configuration management, application deployment and intra-service orchestration. The idea is to automate repetitive IT tasks to allow teams to work on more strategic objectives.

Unlike Puppet, Ansible is agentless, meaning that there's no need for agent installation and management. Commands are run over secure SSH, which can make scaling troublesome. Ready-to-use modules are available from Ansible Galaxy and custom modules can be added as needed.

Ansible is written in Python and uses YAML, both of which are considered relatively easy to learn.



### Chef

Chef is a configuration management tool for dealing with machine setup on physical servers, virtual machines and in the cloud. It helps developers and IT operations professionals to work together to deploy applications on IT infrastructure.

Like Puppet, Chef is an older mature tool with a master-agent architecture. It uses a Ruby-based domain specific language (DSL) and is considered to be more developer-friendly, though with a steep learning curve.



### SaltStack

SaltStack is an open source configuration management software and remote execution engine. It pulls developer code and configuration information from a central code repository and pushes that content remotely out to servers. Its primary differentiator is speed, as its multithreaded design enables the execution of hundreds or even thousands of simultaneous tasks.



### CFEngine

CFEngine is a configuration management system written in C, and is available as both open source and commercial software. It provides automated configuration and maintenance of large-scale computer systems, such as servers, desktops, and mobile phones.



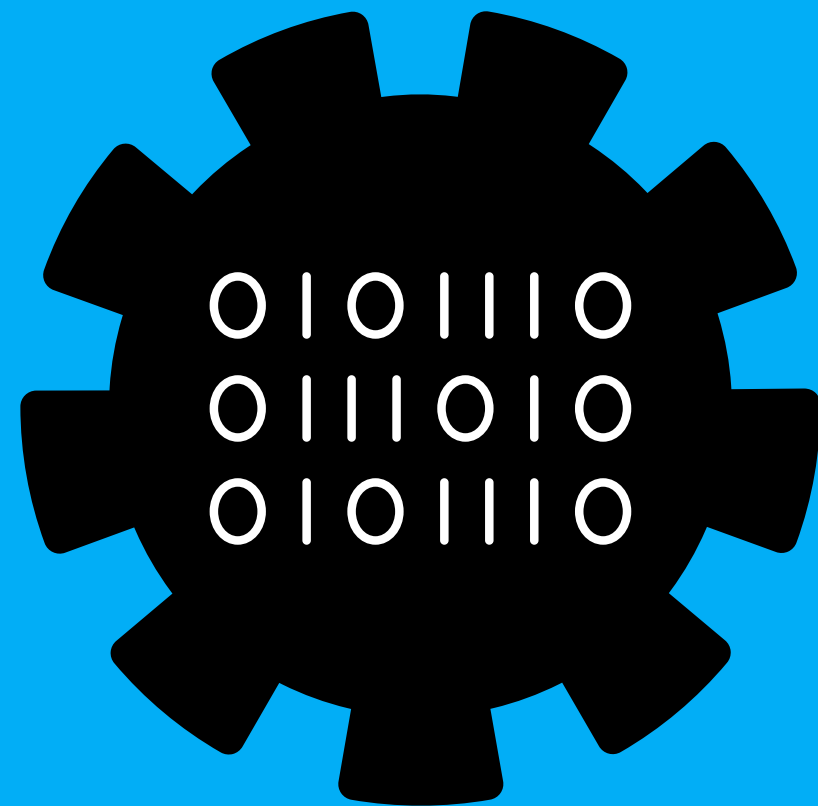
### RUDDER

RUDDER is a free, open source, and multi-platform configuration management and continuous audit solution dedicated to production infrastructure needs. It is written in Scala and C, and is used to help automate system configuration across large IT infrastructures. Built-in features include change requests, audit logs, and strong authentication.

RUDDER is an established project with several tens of thousands of managed nodes in companies of all sizes.



# Artifact Management Tools



Artifact management tools store, organize and distribute binary files and their associated metadata in a single centralized location. Those files might consist of project source code, dependencies, resources, or containers.

Artifact management aims to prevent inconsistencies by allowing development teams to find the right version of an artifact easily, and also reduces the amount of time spent downloading dependencies from a public place.

Artifact management tools usually provide functions like versioning support, retention, access control, and promotion. Ultimately, they enhance developer collaboration, improve build stability, and accelerate CI/CD workflows.



### Docker

Docker is a software container platform. Originally released in 2013 as an open source Docker Engine, it has grown enormously in popularity and now has an integral place in most DevOps toolchains.

Docker enables developers to easily pack, ship, and run any application as a lightweight, portable, self-sufficient container, which can run almost anywhere. This eliminates “works on my machine” problems when collaborating on code, ensuring that applications work seamlessly in any environment.

Docker containers are the preferred replacement for Virtual Machines (VMs), given that they boot faster, perform better, and consume less memory resources. Docker Containers are also able to share a single kernel and share application libraries.



### npm

npm is a package manager for JavaScript that serves as the default package manager for the JavaScript runtime environment Node.js. npm makes it easier for you to install and manage the tools that come with Node.js, such as Gulp and Grunt. It installs packages locally or globally and helps to manage dependencies.

npm’s overarching goal is to automate dependency and package management, thereby saving time while making it easier to collaborate and share projects.



### PyPI

The Python Package Index (PyPI) is the official third-party public software repository for the Python programming language. PyPI helps users find, install, and distribute software developed and shared by the Python community. Pip, the Python package installation tool, is used to install files from PyPI.

PyPI is maintained by an independent group of developers known as the Python Packaging Authority (PyPA), and is supported by the Python Packaging Working Group (PackagingWG).



### JFrog Artifactory

JFrog Artifactory is a binary repository manager that supports a number of software package formats, including Maven, Debian, npm, Helm, Ruby, Python, and Docker. Features include high availability, replication, disaster recovery, and scalability. Artifactory caches remote artifacts locally for reuse, supports large load bursts with high concurrency, and can automate all aspects of artifact management using Artifactory REST API.

Compared to Nexus, Artifactory supports more repository types and has more functionality out of the box.



### Yarn

Yarn is an open source JavaScript package manager from Facebook, Google, and Tilde. Like all package managers, it automates the process of installing, updating, configuring, and removing pieces of software retrieved from a global registry.

Yarn was initially created to improve upon npm's shortcomings. The idea was that with Yarn, engineers could still have access to the npm registry, but could also install packages more quickly and manage dependencies consistently across machines or in secure offline environments. Since then, npm has addressed both issues.



### Nexus

Nexus by Sonatype is a repository manager that organizes, stores and distributes artifacts needed for development. With Nexus, developers can completely control access to, and deployment of, every artifact in an organization from a single location, making it easier to distribute software. It is most commonly used for hosting Apache Maven. Currently it supports Maven/Java, npm, NuGet, RubyGems, Docker, P2, OBR, APT and YUM and more.



### Archiva

Apache Archiva is a build artifact repository manager from the Apache Software Foundation. It is used with build tools such as Maven, Jenkins, Continuum, and ANT. With Archiva, developers can share artifacts with each other and manage the associated security required, aggregate (proxy) content from remote artifact repositories, visualize artifact utilization with search, browse and reporting, and perform routine maintenance on repositories.

The key function of Archiva is to provide on-demand mirroring of Maven's central repository. This eliminates the need to download Maven libraries, thereby minimizing long-distance network communication and allowing you to put all project dependency libraries in a centralized location.



### NuGet

NuGet is a free, open source package manager designed for sharing code on the Microsoft development platform, specifically .NET. NuGet defines how packages for .NET are created, hosted, and consumed, and provides the tools for each of those roles. Those tools include NuGet CLI and DotNet CLI for creating and consuming of packages, as well as Package Manager Console and Package Manager UI for installing and managing packages in Visual Studio projects.

As public host, NuGet maintains a central repository of unique packages, but also enables developers to host packages privately in the cloud, on a private network, or on a local file system.



### Quay

Quay is a hosted private container registry that stores, builds, and deploys container images. Quay also includes features for building and scanning images. It can scan Docker images for security vulnerabilities, identifying potential issues so that you can mitigate security risks. For an example, it can put a layer of indirection between the Docker image ID and the actual image storage that is specific to the repository to which it is associated.



### CloudRepo

CloudRepo is a cloud-native artifact repository manager offering both public and private repositories, for Python and Maven repositories. CloudRepo allows high-performance software development teams to securely store and share artifacts for use in other builds and development processes.

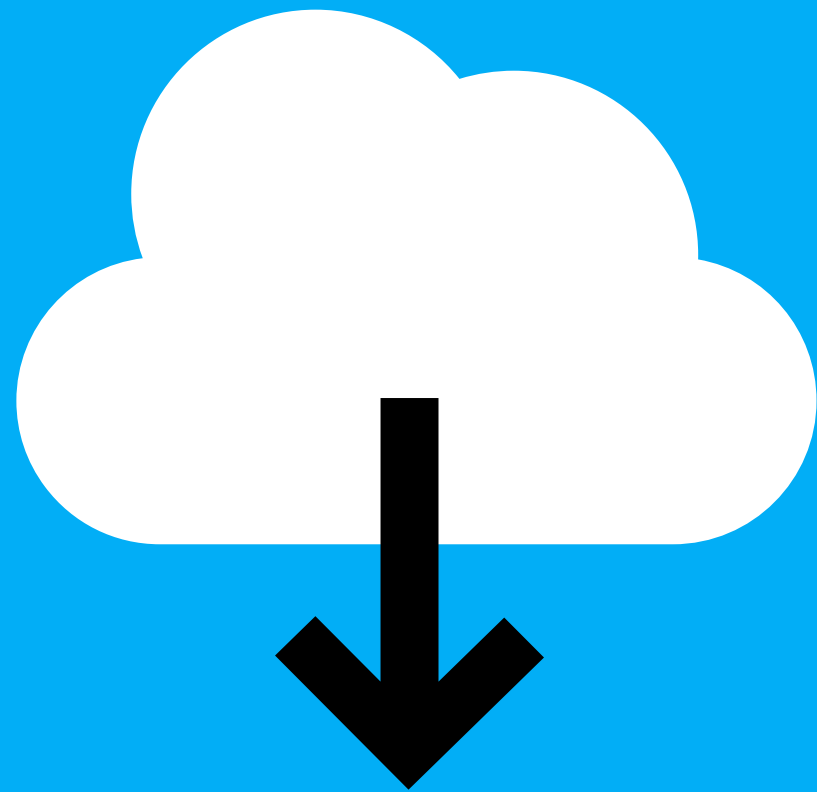
They describe their typical client as a leader or member of a small to medium team that can't afford to spend time and resources installing, maintaining, or configuring their repository manager (ie. Artifactory or Nexus) and other build tools.



### MyGet

MyGet is a Universal Cloud Package Manager. MyGet provides private, cloud-based package management for NuGet, npm, Maven, Python and Ruby packages (with more on the way!) so that software teams can manage all their dependencies in one place and focus on shipping great software. Proxy upstream packages or upload your own internal builds, integrate with build pipelines, scan for vulnerabilities and license compliance, and more.

# IaaS / Cloud Tools



Cloud tools deliver hosted services over the internet, allowing businesses to consume computer resources like a utility without having to build and maintain their own computing infrastructure. They can be divided into three categories: infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS).

IaaS tools provide access to computing resources through a virtual server instance, which replicates the capabilities of an on-premises data centre. PaaS tools expand on the IaaS model by providing not only infrastructure, but also middleware, development tools, business intelligence, database management systems and more. SaaS tools host applications and make them available to users over the internet.





### AWS

Amazon Web Services (AWS) is a secure cloud services platform that provides compute power, database storage, content delivery and other functionality. It is comprised of more than 90 services, the most popular of which are Amazon Elastic Compute Cloud (EC2) and Amazon Simple Storage Service (S3).



### Azure

Azure is the cloud computing service created by Microsoft to build, test, deploy and manage applications services. Developers can create services for operating environments that will let them build and host services under the Microsoft's infrastructure. Azure supports both Microsoft and non-Microsoft languages.



### Heroku

Heroku is a platform as a service (PaaS) that enables developers to build, run, and operate applications entirely in the cloud. Applications run inside smart containers in a fully managed runtime environment that handles configuration, orchestration, load balancing, failovers, logging, security, and more.

Heroku provides support for the most popular languages such as Ruby and Node.js, high-scale data services including Postgres, Kafka and Redis, and an add-ons ecosystem featuring over 180 cloud application services. Its benefits include fast server setup, easy deployment with Git Push, and a free tier option for beginners looking to experiment in a limited sandbox. The enterprise version of Heroku has a robust feature set, with extensive add-ons for additional services.



### Google Cloud

The Google Cloud Platform (GCP) is a suite of public cloud computing services that run on the same infrastructure that Google uses for Google Search and YouTube. It offers services for computing, storage, networking, big data, machine learning and the internet of things (IoT), as well as cloud management, security and developer tools.



### Rackspace

Rackspace is a managed cloud computing company that aims to make it easy to manage private and public cloud deployments. Its cloud service is both reliable and flexible, with pay-as-you-go scalability, so it is ideal for heavy and unpredictable traffic. It provides Fanatical Support for AWS and Microsoft Azure, and has a strong support team.



### OpenShift

Red Hat OpenShift is a free and open source container application platform as a service (PaaS) for the development, deployment, and management of applications.

It provides developers with an integrated development environment (IDE) for building and deploying Docker-formatted containers, and then managing them with the Kubernetes container orchestration platform. It is a strong choice for businesses looking to move to containers and microservices.

OpenShift provides support for Node.js, Ruby, Python, PHP, Perl, and Java and is extensible so that users can add support for other languages.

Starting in 2019, Azure Red Hat OpenShift became available on Azure. It is a fully managed offering of OpenShift running in Azure.



### OpenStack

OpenStack is a free and open source software platform for creating public and private clouds. It controls large pools of computing, storage, and networking resources throughout a datacenter, all managed through a dashboard that gives administrators control while empowering their users to provision resources through a web interface. It is very powerful, with a large feature set. The community surrounding the tool is also quite active, with a plethora of documentation available.



### Cloud Foundry

Cloud Foundry is an open source, cloud application platform as a service (PaaS) tool on which developers can build, deploy, run and scale applications. It was originally developed in-house at VMware, but is now owned by Pivotal Software.



### Engine Yard

Engine Yard is a platform as a service (PaaS) provider that automates, configures and deploys applications in the cloud. It uses Java, Ruby on Rails, PHP and Node.js for deployments, and offers features like load balancing, cloning, and database replication. It is more affordable than Heroku and Rackspace.



### Flynn

Flynn is an open source platform as a service (PaaS) tool for running applications in production. It is designed to run anything that can run on Linux, and comes with highly available database appliances, including PostgreSQL, MySQL, and MongoDB. It can scale and has the ability to be highly available. Flynn is considered to be a self-hosted alternative to Heroku, or a more production-ready version of Dokku.



### **Dokku**

Dokku is an open source, self-hosted, and extensible platform as a service (PaaS) that makes deploying applications simple using Git. It is designed to be a single-host version of Heroku, but with a more limited feature set. Dokku can be thought of as a mini-PaaS for simple deployments, such as or hobby and side projects that do not require high availability. It is also a good solution for internal services.

Dokku has a number of plugins that work reasonably well out of the box, including Postgres, Maria DB, Mongo, and Redis. However, because they are supported by the community, some may experience issues or be out of date.



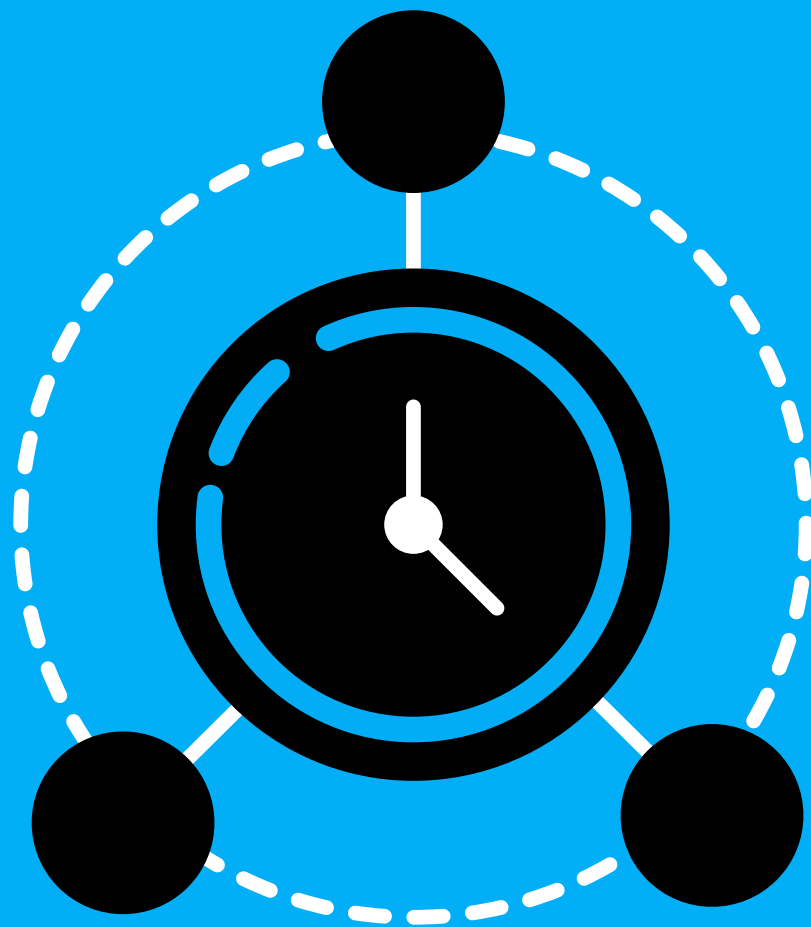
### **Morpheus**

Morpheus is an agnostic cloud management platform (CMP) designed to unify management of multi-cloud and hybrid IT for DevOps teams. It can be used for application lifecycle management, migrating between clouds, and orchestrating hybrid cloud deployments. Its features include automatic monitoring and logging, automatic backups, self-service provisioning of app components, built-in monitoring and incident management, and on-demand scaling and cloning. Users find it to be relatively easy to setup and implement, and it speeds up provisioning and deployments considerably.

# Orchestration & Scheduling Tools

Orchestration and scheduling tools strive to eliminate silos, streamline processes and automate repetitive tasks so that IT departments can move quickly and efficiently. While similar to automation, orchestration goes beyond the scope of automation by focusing on workflows or processes rather than simple tasks.

In the past few years, containers have dramatically changed the way software organizations build, ship, and maintain applications. Container orchestration tools are concerned with managing the lifecycles of those containers, and aim to automate the deployment, management, scaling, networking, and availability of container-based applications.

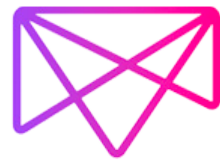




### Kubernetes

Originally designed by Google, Kubernetes is an open-source platform that automates deployment, scaling, and management of containerized applications. It clusters groups of hosts running Linux containers in logical units for easy management and discovery. These clusters can span hosts across public, private, or hybrid clouds. This makes Kubernetes a good choice for hosting cloud-native applications that require rapid scaling.

With Kubernetes, you can orchestrate containers across multiple hosts, mount and add storage to stateful applications, scale containerized applications on the fly, and control and automate deployments and updates. Features include container grouping, self-healing, load balancing, DNS management, rollback, and resource monitoring and logging. However, Kubernetes is not a complete solution and is meant to be used with plugins.



### MESOSPHERE

#### Mesosphere

Mesosphere develops software for data centers based on Apache Mesos. It expands on the cluster management capabilities of Apache Mesos, combining it with other components to enable an easy way to scale applications. Its primary product is the Datacenter Operating System (DC/OS).



#### Rancher

Rancher is an open source deployment tool for Kubernetes. It enables developers to launch cloud Kubernetes services from Google, Amazon or Microsoft. Its features include unified cluster management, application workload management, and centralized policy management.



### Nomad

#### Nomad

HashiCorp Nomad is an open source clustered scheduling engine that can run a diverse workload of micro-service, batch, containerized and non-containerized applications. It enables organizations to automate the deployment of any application on any infrastructure at any scale.

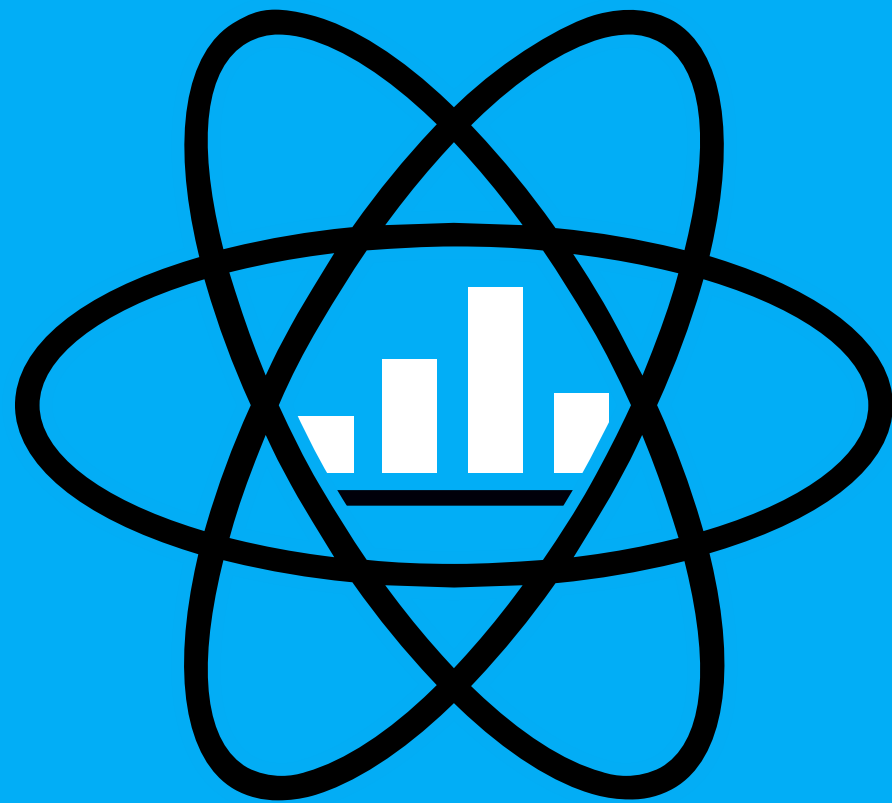


### MARATHON

#### Marathon

Marathon is a production-grade container orchestration platform for Mesosphere's Datacenter Operating System (DC/OS) and Apache Mesos. It is designed to launch long-running applications, and, in Mesosphere, serves as a replacement for a traditional init system.

# BI / Monitoring / Logging Tools



Logging tools aim to facilitate the generation, transmission, analysis, and storage of log data produced by applications and infrastructure.

Application performance monitoring (APM) tools then use that log data to track various systems, such as servers, networks, databases, and websites, in order to monitor performance, stay ahead of any potential issues, and ensure that users can access the system.

Business intelligence (BI) tools take logging and monitoring one step further, helping enterprises to analyze and visualize data in order to make better business decisions. The data is commonly collected into a data warehouse or data mart, where it can be organized and presented in historical, current, and predictive views. BI tools are used to increase operational efficiency, identify new revenue potential, spot market trends and support business health planning.





### Google Analytics

Google Analytics is a freemium marketing and analytics platform that tracks and reports website traffic. It allows you to measure digital marketing effectiveness with features like real-time reporting, user flow visualization, funnel analysis, segmentation, and much more. It is the most popular website statistics tool, and integrates seamlessly with other Google services like AdWords and Search Console.

Google Analytics collects data through a JavaScript tag that, once added to every page of the website, gathers visitor information. The tracking code runs in the client browser and is reliant on cookies.



### Kibana

Kibana is an open source analytics and visualization platform that visualizes log data as charts, graphs, trendlines, maps, and scatter plots. It is commonly used with Elasticsearch, a tool that allows you to search and analyze logs, and Logstash, a tool that routes logs. When all three tools are used together, they are known as the ELK stack.



### Elasticsearch

Elasticsearch is an open source, distributed, JSON-based search and analytics engine. It allows you to perform and combine many types of searches, including structured, unstructured, geo, and metric. Elasticsearch is commonly used with Kibana, a web interface that visualizes log data, and Logstash, a tool that routes logs. When all three tools are used together, they are known as the ELK stack.



### Logstash

Logstash is an open source, server-side data processing pipeline that collects, parses, and stores logs. These logs can be system logs, webserver logs, error logs, or app logs. Logstash is commonly used with Kibana, a web interface that visualizes log data, and Elasticsearch, a tool that allows you to search and analyze logs. When all three tools are used together, they are known as the ELK stack.



### Airbrake

Airbrake is error monitoring software that collects and aggregates errors in web apps for developers. It aims to reduce debug time with real-time alerts, detailed reports, and a web-based dashboard, which allow developers to find and fix bugs as they happen. Airbrake works best with Ruby, but also supports most major programming languages and frameworks.



### **Splunk**

Splunk is a software platform for searching, monitoring, and analyzing machine data in real time. It aims to make machine data accessible by identifying data patterns, providing metrics, diagnosing problems, and providing intelligence for business operations.



### **New Relic**

New Relic's SaaS application monitoring platform (APM) enables developers, ops, and tech teams to measure and monitor the performance of their applications and infrastructure. New Relic can identify performance issues, monitor page performance, and send notifications for certain metrics. It provides proactive management, allowing organizations to detect, track, and fix errors in their websites before customers are affected.

Features include New Relic Radar, which provides a personalized feed of cards designed to highlight abnormal behavior within the application, and dynamic baselines, which use historical data to predict logical thresholds for what constitutes an abnormality. New Relic does not handle logs, but integrates with logging tools like Splunk and Sumo Logic.



### **Prometheus**

Prometheus is an open source monitoring system originally built at SoundCloud. It collects metrics from configured targets at given intervals, evaluates rule expressions, displays the results, and can trigger alerts if some condition is observed to be true. Its features include a multi-dimensional data model, flexible query language, autonomous single server nodes, and multiple modes of graphing and dashboarding support.

Many DevOps organizations are moving towards Prometheus because it is native to containerized environments and integrates with Kubernetes.



### **Pingdom**

Pingdom's website monitoring platform enables you to monitor your website's availability and performance with features like uptime monitoring, real user monitoring, synthetic interaction testing, page speed monitoring, alerting, and root cause analysis.

Pingdom also offers a popular free tool, the Pingdom Website Speed Test, which can be used to test your website or a competitor's website for load time, page size, and performance in general. Pingdom was acquired by SolarWinds in 2014.



### **Raygun**

Raygun is a cloud-based monitoring and bug tracking platform that offers crash reporting, application performance monitoring, and real user monitoring. Features include a powerful search function built on Elasticsearch that allows you to drill in with query modifiers, smart notifications, application health charts, and excellent support for languages like Ruby, Java, JavaScript, PHP, .NET, ColdFusion, and more.



### **Zabbix**

Zabbix is an enterprise-class open source monitoring tool for diverse IT components, including networks, servers, virtual machines (VMs) and cloud services. It monitors thousands of metrics collected from physical machines or virtual machines, and displays them through a web-based management interface. The core strength of Zabbix is in monitoring custom parameters that are not supported by standard monitoring methods.



### Grafana

Grafana is an open source visualization tool with support for many databases, including Graphite, InfluxDB, Prometheus, and Elasticsearch. It is designed for analyzing and visualizing metrics such as system CPU, memory, disk and I/O utilization. Grafana does not collect data, but allows you to connect to data sources like Prometheus or Graphite. It is a popular solution for bringing together and visualizing disparate data sources.

In Grafana, users can create versatile dashboards with graph, singlestat, table, heatmap, and freetext panels. Dashboards and panels are fully customizable and can be annotated to track specific events. These dashboards can be used for everything from identifying anomalies and debugging applications, to gaining actionable insights on user behavior.



### Dynatrace

Dynatrace is an application performance management (APM) software provider that monitors infrastructure to identify application performance issues. It also helps developers, testers and operations to ensure their applications work quickly and reliably by tracing every single transaction (web requests, batch jobs, etc.) from end-to-end.

Dynatrace is easy to install, with very little setup and configuration required. However, it does not offer APM for Ruby.



### Nagios

Nagios provides enterprise-class open source monitoring including data gathering, data archiving, dashboards, and alerting for systems, networks, and infrastructure. Its products include Nagios XI for server and network monitoring, Nagios Log Server for centralized log management, Nagios Network Analyzer for netflow analysis, and Nagios Fusion for a centralized view of monitoring infrastructure.

Originally released in 2002, Nagios is one of the older monitoring tools still available today. Its strengths lie in its scalability for simple and static setups, easy to understand plugin architecture, and deep ecosystem of plugins for extending functionality. It also has a number of popular direct alternatives including Check\_MK, which began life as a Nagios extension, and Icinga, a Nagios fork.



### Datadog

Datadog is a software as a service (SaaS) data analytics platform that provides monitoring services for cloud-scale applications. It collects data from servers, containers, databases, and third-party services to make your stack observable, and has a flexible monitoring/graphing interface that allows you to display complex graphs without coding.

Datadog is considered to be a best-of-breed monitoring solution and has a lot of integrations out of the box, but also features a heftier price tag compared to other tools in the category.



### App Dynamics

AppDynamics is an application performance management (APM) and IT operations analytics (ITOA) platform. It helps to analyze, optimize and predict bottlenecks in complex information systems. This can be done in real time, in product and testing environments, on-site and in the cloud.



### PagerDuty

PagerDuty is an incident management platform for IT departments that provides reliable incident notifications via email, push, SMS, and phone, as well as automatic escalations, on-call scheduling, and other functionality to help teams detect and fix infrastructure problems quickly.



### Rollbar

Rollbar provides real-time error alerting and debugging tools for developers. Its features include support for all major languages including JS, PHP, Ruby, .Net, and WordPress, smart error grouping, code deployment tracking, custom log messages, JavaScript source maps, and full-text searching.



### Graphite

Graphite is a free, open source tool that monitors and graphs numeric time-series data, which is typically collected from collection daemons or other monitoring solutions, such as Nagios or Prometheus. Once the data is collected, Graphite has a built-in UI that provides useful visualizations via its Django web application. Graphite can be used to track the performance of websites, applications, business services, and networked servers.



### Opsgenie

Opsgenie by Atlassian is a cloud-based incident management platform for operating always-on services. It provides reliable alerts, on-call schedule management, and escalations. In terms of standout features, it has a quiet hours feature that lets you disable alerts, as well as a heartbeats feature that generates notifications if scheduled jobs don't check in within the allotted timeframe. OpsGenie has a friendly UI that's easy to use, as well as competitive pricing.



### Runscope

Runscope is a SaaS company that provides solutions for API performance testing, monitoring and debugging. It allows software developers, QA testers, DevOps engineers, and other API stakeholders to collaborate in creating, managing and executing functional API tests and monitors.



### Beats

Beats are lightweight data shippers that can be installed as agents on your servers to send specific types of operational data to Elasticsearch. Beats have a small footprint and use fewer system resources than Logstash. Elastic provides Beats for capturing audit data, log files, availability, metrics, network traffic, and Windows event logs. Beats can also be created and shared with the open source community.



### Moogsoft

Moogsoft provides Algorithmic IT Operations (AIOps) solutions that streamline IT incident resolution. Features include noise reduction, agile workflows, event clustering and correlation, and root cause analysis.



### Zipkin

Zipkin is an open source distributed tracing system for microservices, first developed by Twitter to track Web requests. It helps to gather and manage timing data needed to troubleshoot latency problems in microservice architectures.



### Riemann

Riemann is an open source monitoring tool written in Clojure. It aggregates events from hosts and applications and can feed them into a stream processing language to be manipulated, summarized, or actioned.





### Atlas

Atlas is a dimensional time series database that captures operational intelligence. It was originally developed by Netflix to manage dimensional time series data for near real-time operational insight. Atlas features in-memory data storage, allowing it to gather and report large numbers of metrics very quickly.



### Grok

Grok

Grok is an AI operations (AIOps) platform that proactively resolves IT incidents using machine intelligence and automation. It senses behaviors that lead to downtime using anomaly detection, then triggers actions based on those insights. Its features include customizable dashboards, script-based automation, and intranet embeddable dashboard



### Vizceral

Vizceral is a component for displaying traffic data on a WebGL canvas. Once a graph of nodes and edges with data about traffic volume is provided, it will render a traffic graph animating the connection volume between nodes. It was originally developed to understand the state of Netflix's complex microservice architecture in any given region, at a glance, when performing a traffic failover.



### APImetrics

APImetrics is an API performance and quality monitoring system that has two primary functions: API monitoring, for taking the pulse of your API product and user experience, and SLA measurement to monitor the performance of third-party APIs that integrate with your product.



### Sentry

Sentry is an open source error tracking tool platform that helps developers to monitor and fix crashes in real time. It can monitor physical servers, virtual servers, disk arrays, fiber switches, tape libraries, and custom applications.



# Deliver high quality software using your existing toolchains

Our value stream management platform correlates and interconnects your existing tools, eliminating silos and enabling visibility, governance and collaboration. Improve the speed and quality of complex application delivery with Plutora.

[www.plutora.com](http://www.plutora.com)

**PLUTORA®**