

Integration and Orchestration of multiple Micro-services based Opensource projects

SODA Devops & CI

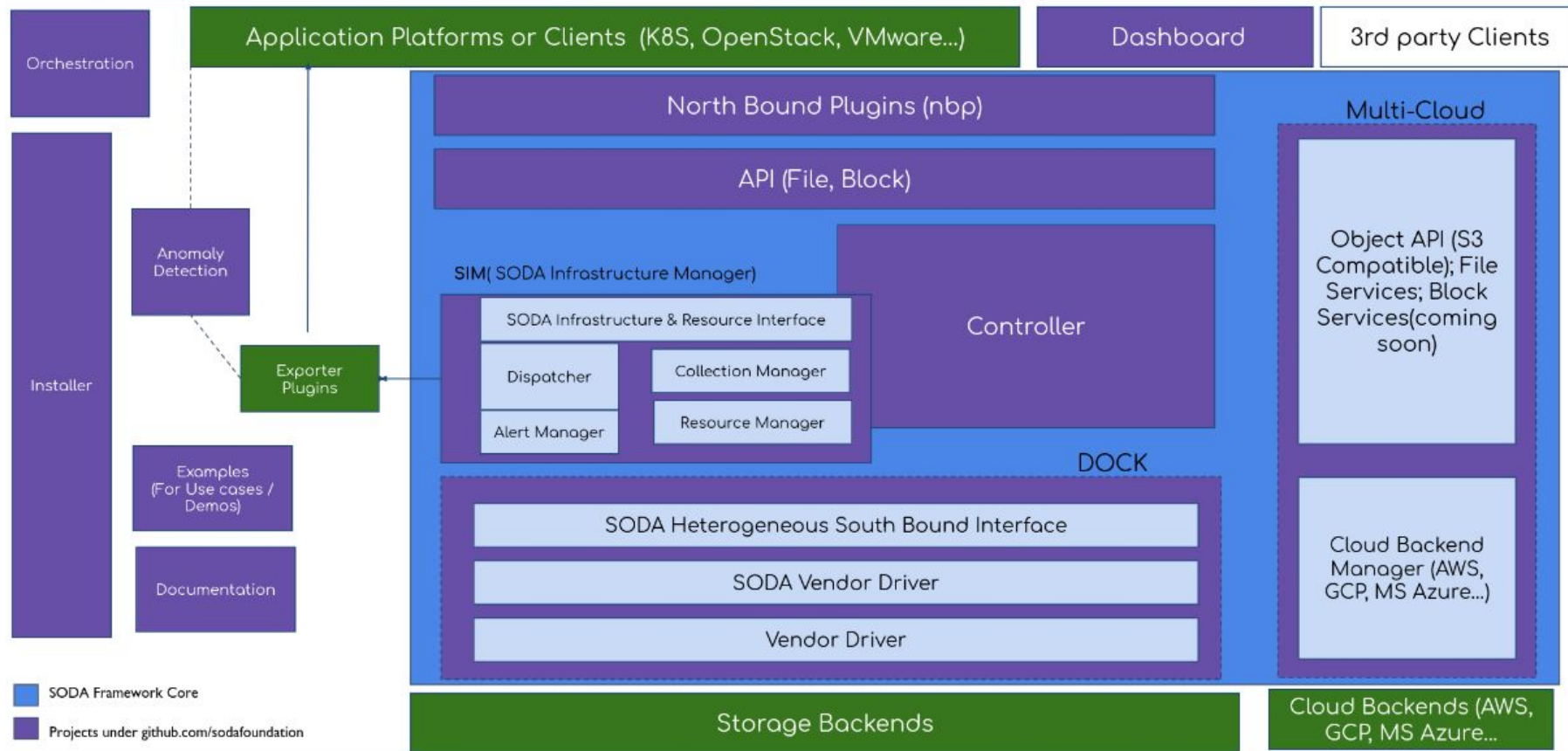
Rajat R Verma (Lead Architect, Huawei Technologies India Pvt Ltd)



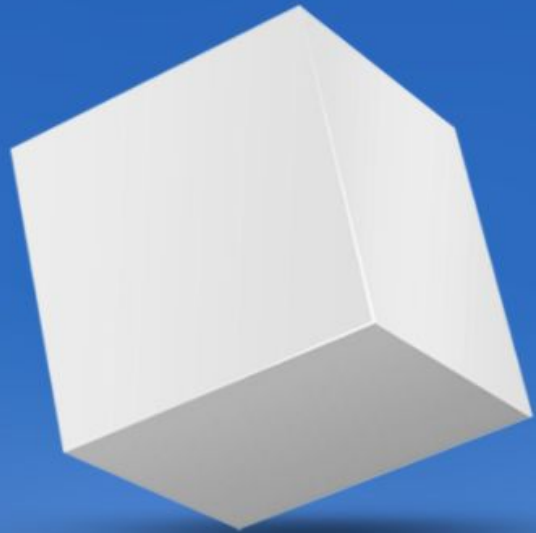
Agenda

- SODA Architecture
- Microservices overview
- Devops overview
- Installation - Ansible
- CI - Travis
- Static checks - SonarQube
- Deployment - Jenkins
- UI - Angular
- Documentation - Swagger

SODA Projects Architecture



Microservices



Monolith

VS.



Microservices

Monolith

Vs

Microservices

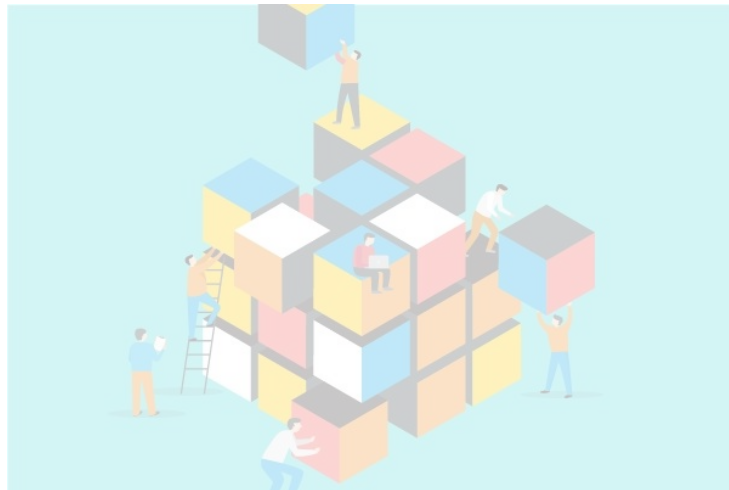
- Long Build / Test / Release cycles.
- Difficult to Scale product / teams.
- Operations is a nightmare !
- Architecture is hard to maintain and evolve
- Long time to add features - Tight coupling
- Upgrading the technology is difficult.
- Lack of agility
- New Release takes months
- Customers....waiting.

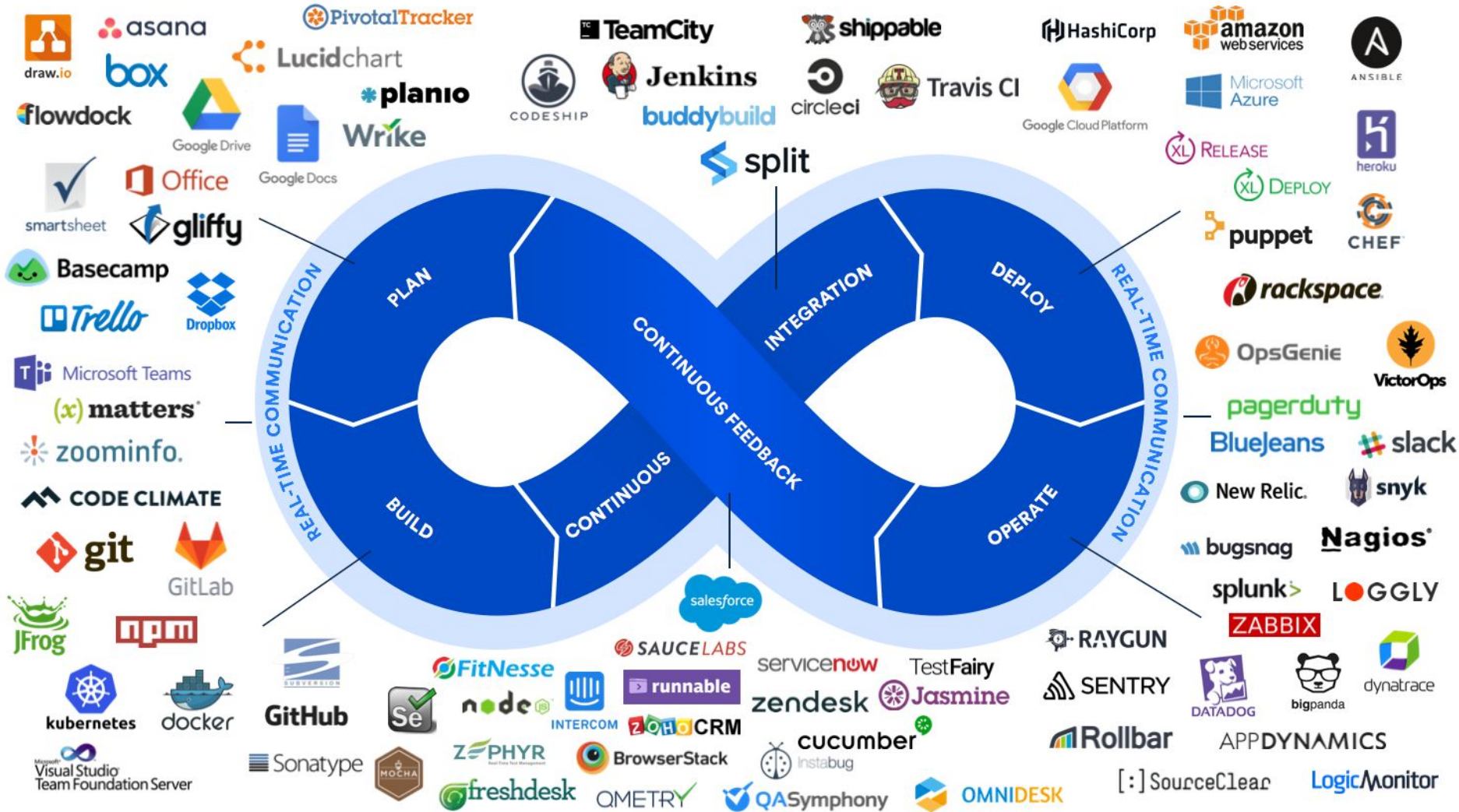
microservices are “**loosely coupled service oriented architecture** with bounded contexts.” - Adrian Cockcroft

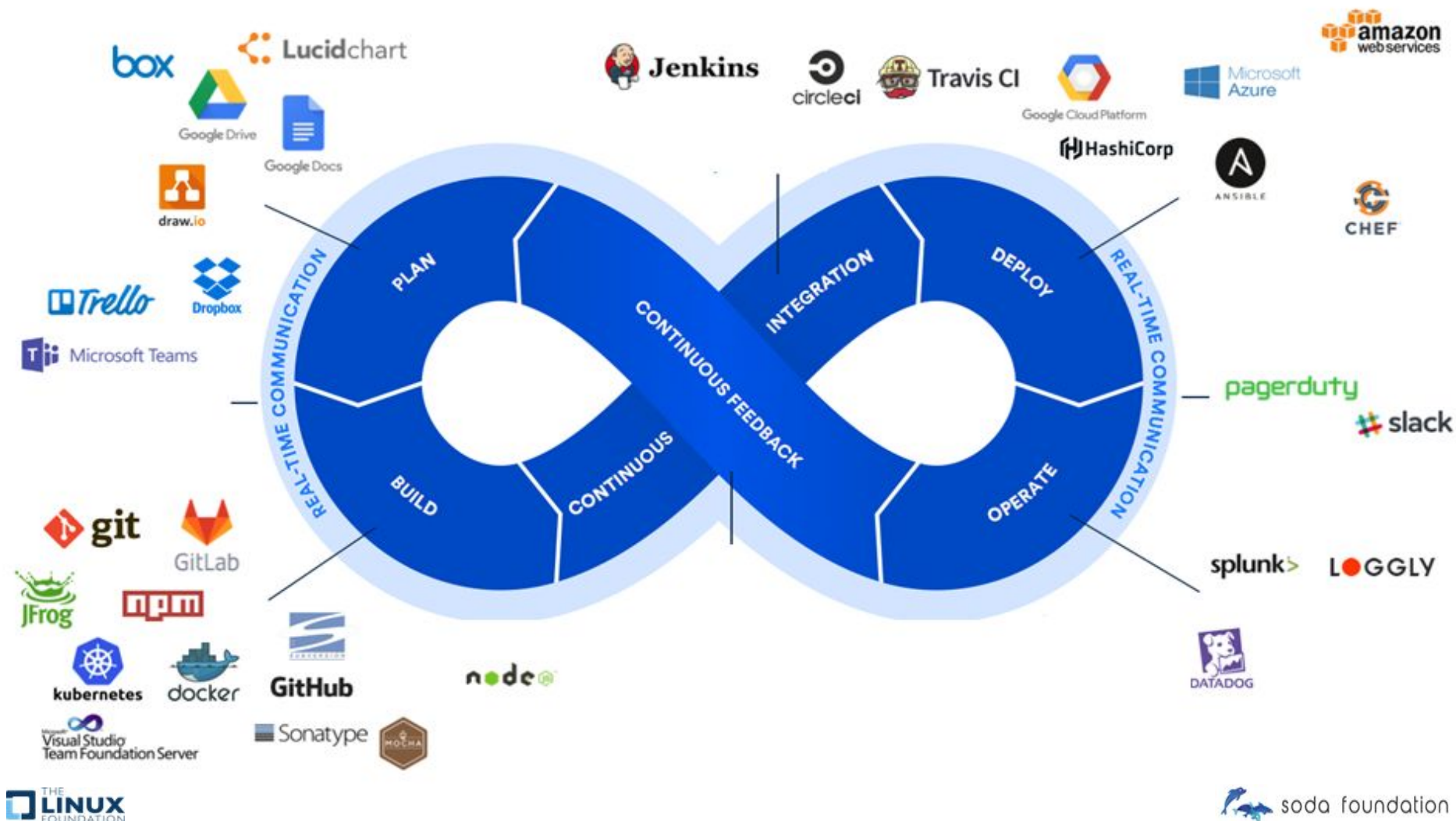
*the microservice **architectural style** is an approach to developing a **single application as a suite of small services**, each running in its **own process** and **communicating with lightweight mechanisms**, often an **HTTP resource API**.* - Martin Fowler

Microservice Architecture

- Componentization via Services
- Smart endpoints and dumb pipes
- Loosely coupled
- Decentralized Data Management
- Infrastructure Automation
- Design for failure
- Evolutionary Design
- Highly maintainable and testable
- Independently deployable
- Organized around business capabilities
- Owned by a small team







Installation - Ansible



- **Agentless Automation tool** used to **configure systems, deploy software**, and orchestrate IT tasks.
- **Simplicity and ease-of-use**. Focus on security and reliability, uses OpenSSH for transport
- Uses YAML , **easy to learn and get started**.
- Organized into reusable **Modules, Playbooks and Roles**
- **Loose coupling** and easy maintenance of codebase.
- Other tools to consider
 - Chef
 - Puppet
 - Salt
 - Terraform
 - Kubernetes

Installation ...other options

- Installation using Salt.
- Deploy SODA Foundation projects using k8s Helm Charts.
- Local cluster installation using Shell scripts.
 - Each of the SODA services is independently installable.
 - CI for Installer is cumulative, i.e it passes only if the install for all the services pass.

Orchestration - Docker Compose



Docker Compose

- Tool for defining and running multi-container Docker applications.
- YAML file to configure application's services
- Single command to create and start all the services from the configuration.

Commands for managing the whole lifecycle of the application:

- Start, stop, and rebuild services
- View the status of running services
- Stream the log output of running services
- Run a one-off command on a service

Other alternatives

- Kubernetes
- Docker Swarm
- Helm
- Terraform

CI - Travis



- Free for Open Source projects
- Quick setup & integration with Github
- Live build views
- Pull request support
- Pre-installed database services
- Auto deployments on passing builds
- Clean VMs for every build

Other alternatives

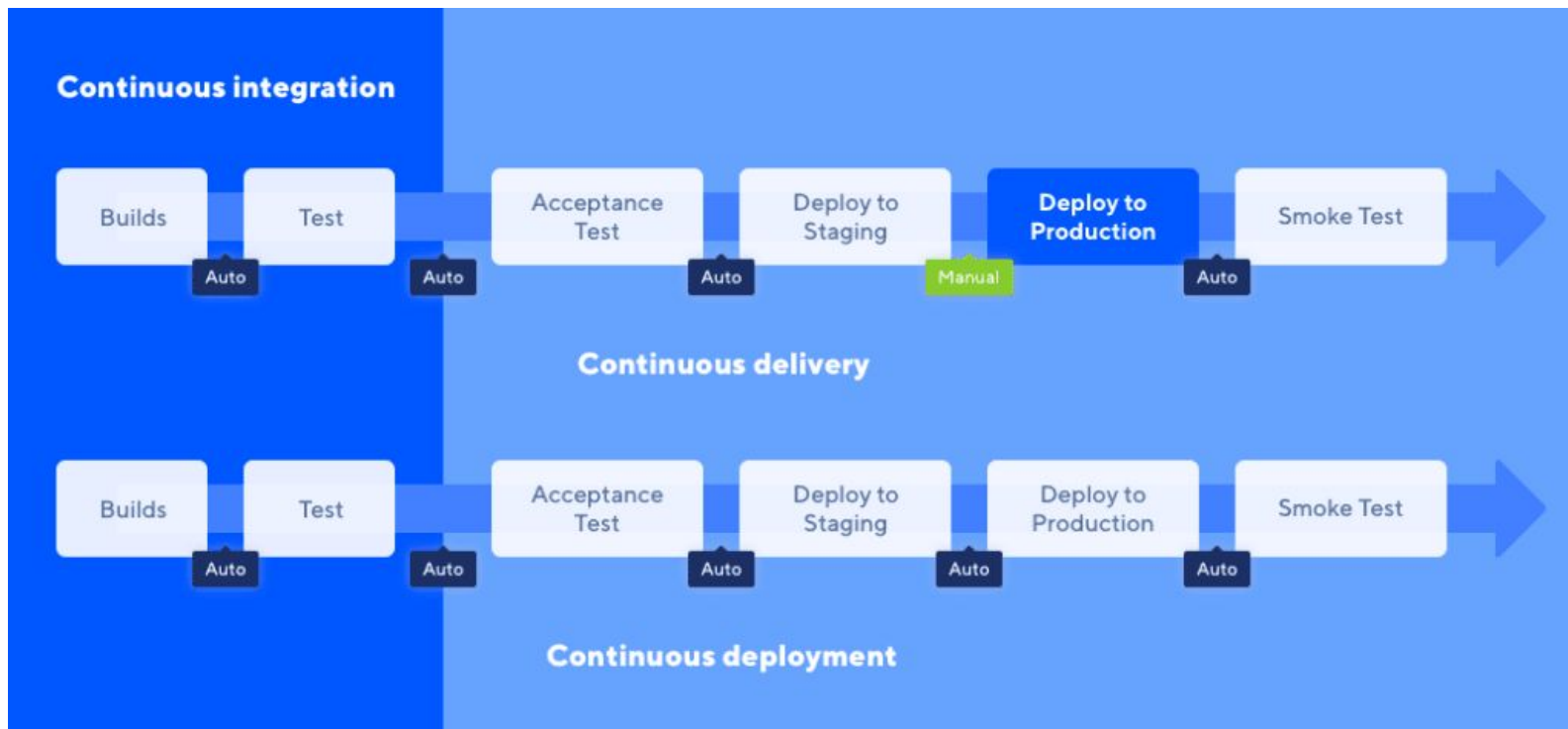
- Circle CI
- Jenkins
- Bamboo
- Go CD

Static Checks - SonarQube

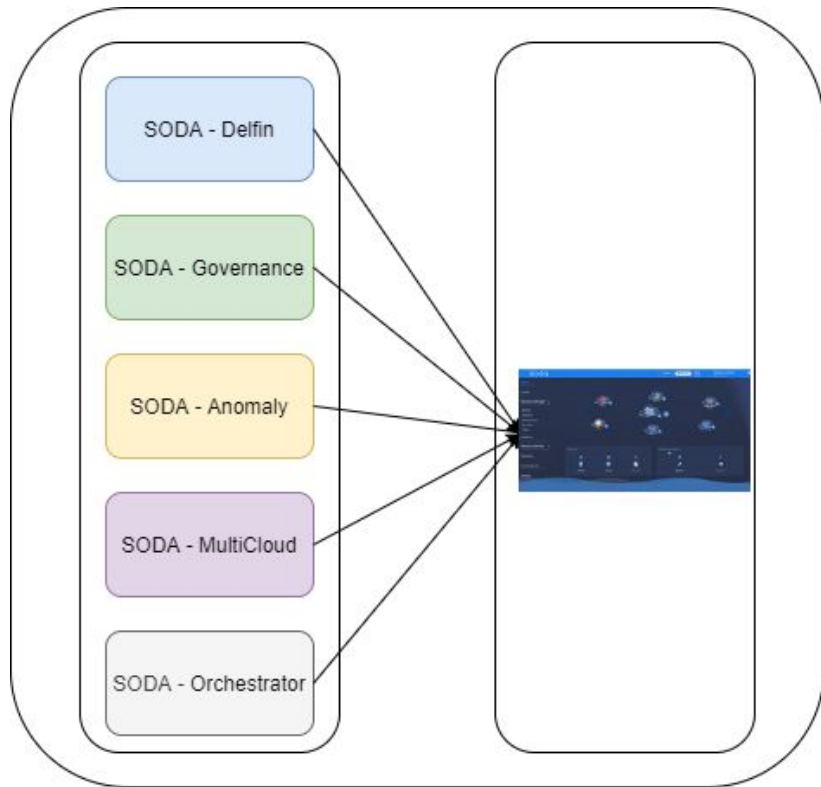


- Static code checks help to unearth bugs and vulnerabilities early.
- Based on configurable rules.
- Easy to integrate with CI tools like Jenkins, BitBucket etc. via Webhooks.
- Support for vast range of Languages.
- SonarQube hosted on the Cloud as SonarCloud.

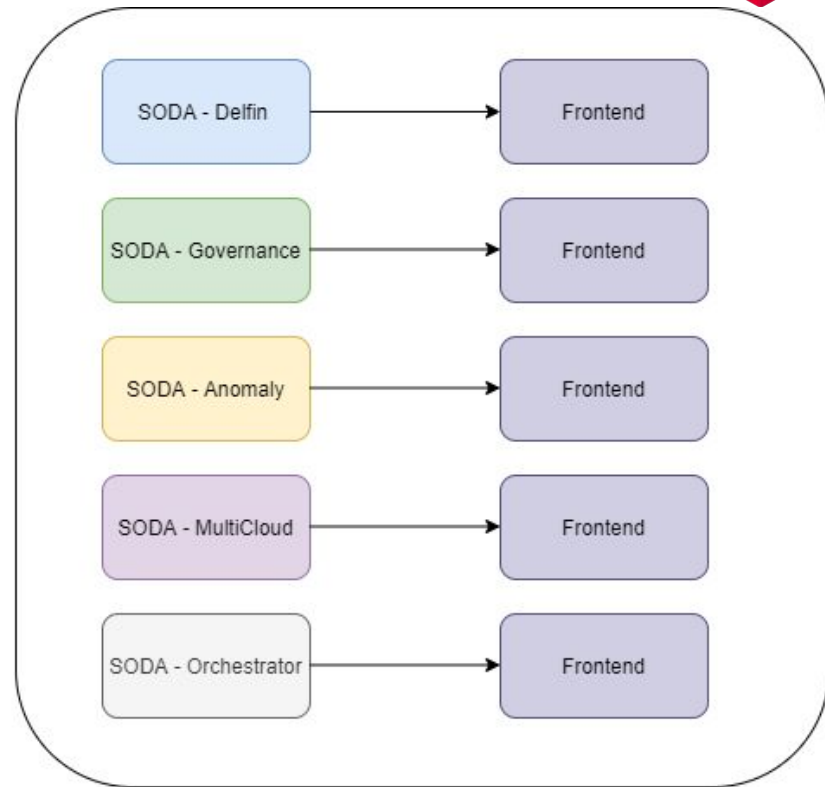
CD - Deployments



UI - Angular



Monolithic UI



Composite UI

References...

Microservices : <https://martinfowler.com/articles/microservices.html>

Devops : <https://www.atlassian.com/>

Docker Compose : <https://docs.docker.com/compose/>

Disclaimer : Content has been taken from various publicly available sources*

Thank You



soda foundation

<https://sodafoundation.io/>

SODA Source Code: <https://github.com/sodafoundation>

SODA Docs: <https://docs.sodafoundation.io/>

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