



Scaling Continuous Delivery to Walmart

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Save money. Live
better.



2.3 million
associates



270 million
weekly customers



\$500.3
billion
annual sales



11,700
stores
28 countries

Delivering at Scale

Hundreds of development teams

Multiple lines of business

Edge nodes and cloud

Diverse tech stacks



First Rule of DevOps?

Don't talk about DevOps



Focus on outcomes

Foster the culture

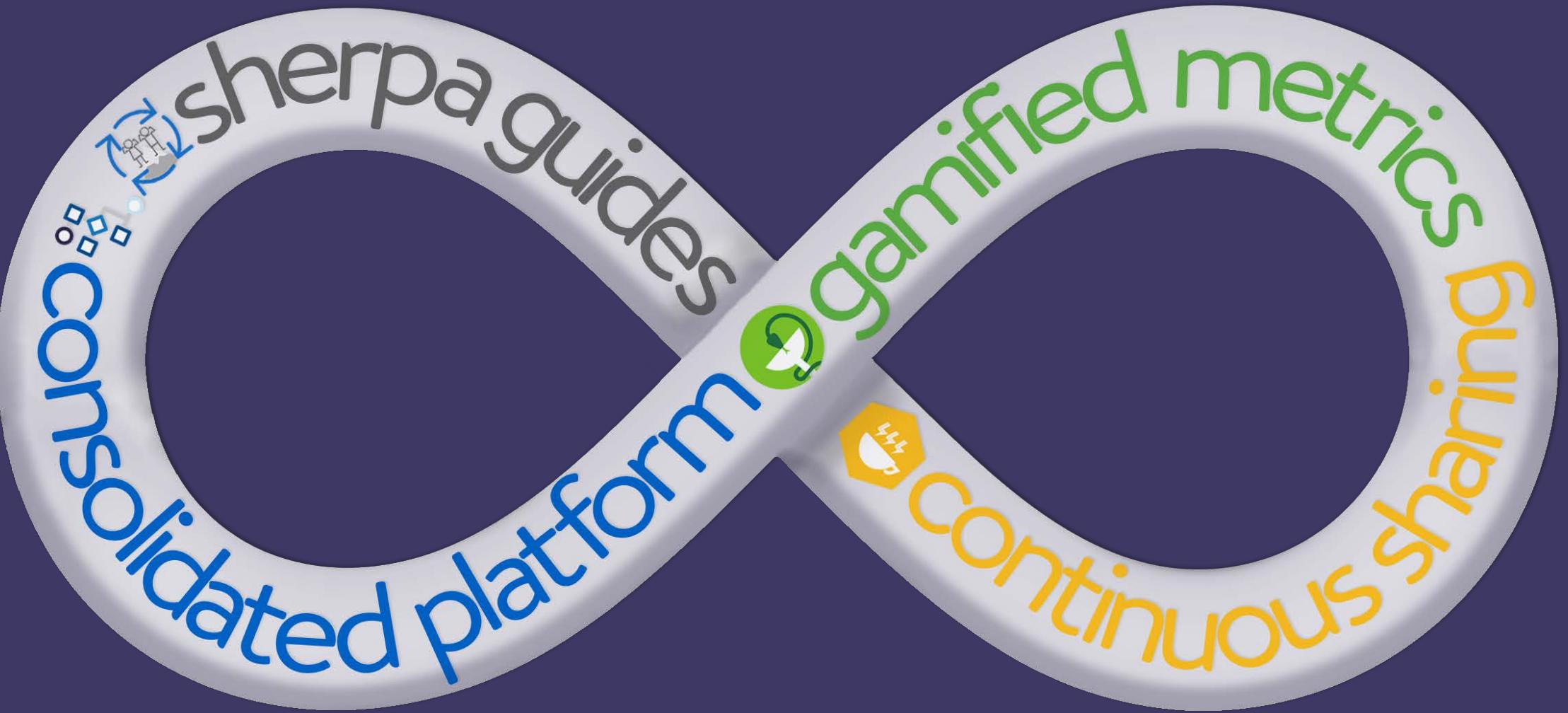
A formation of nine Blue Angels F/A-18 Hornets is flying in the sky, leaving white smoke trails. They are arranged in three rows of three, performing a precision maneuver. The aircraft are blue with yellow accents and "U.S. NAVY" markings.

Growing Effective Teams

Trunk Based Development

Continuous Integration

Reducing batch size

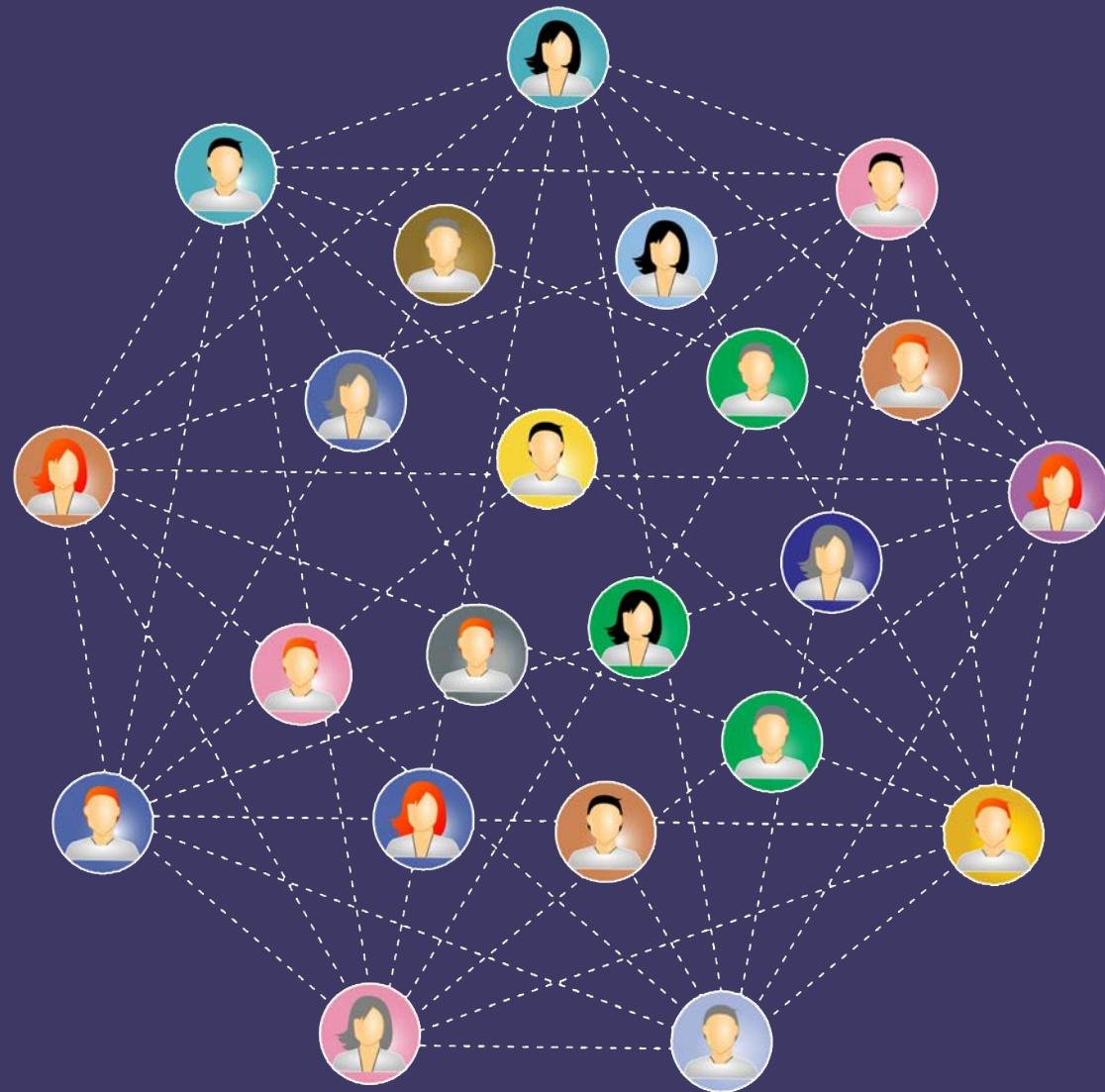




“We're all working together;
THAT'S THE SECRET.”

-Sam Walton





continuous chai

Continuous sharing

Freedom to share ideas and WIP

Networking opportunities

Building a Community

Passion & patience

Keep things interesting

Swag & free food!

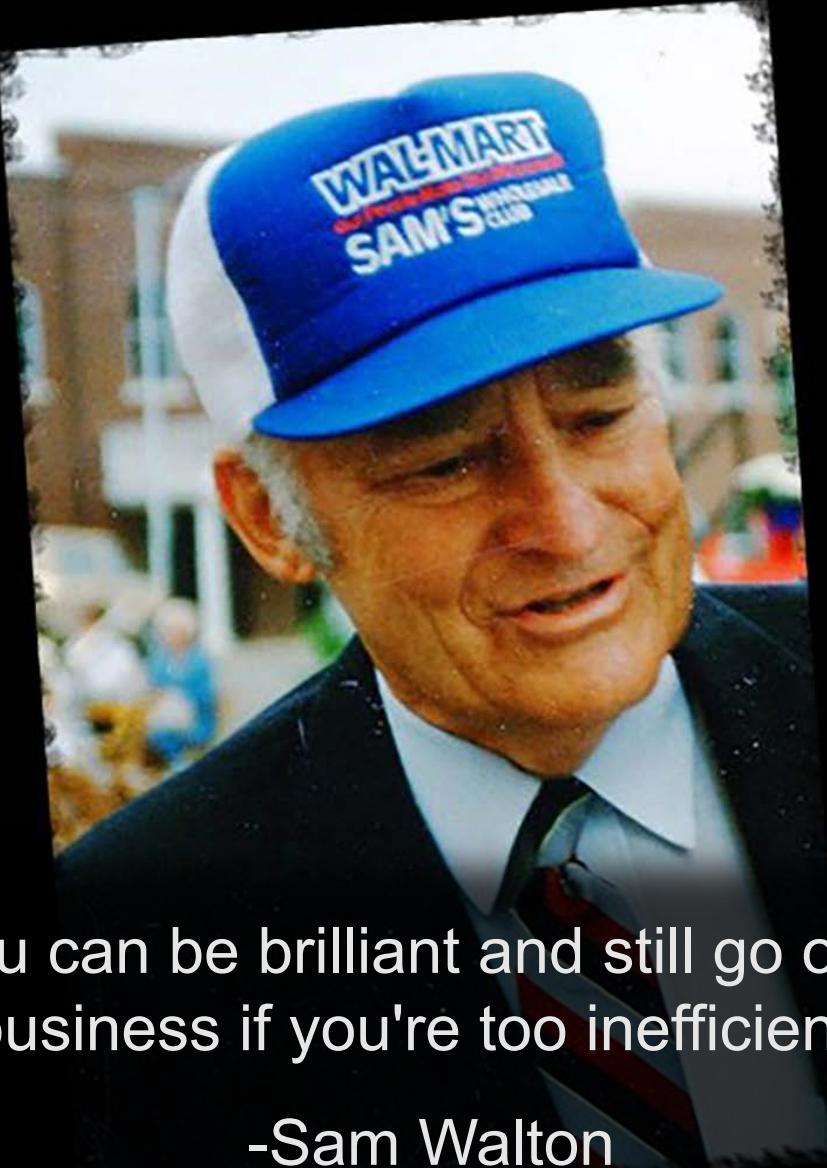


continuous chai



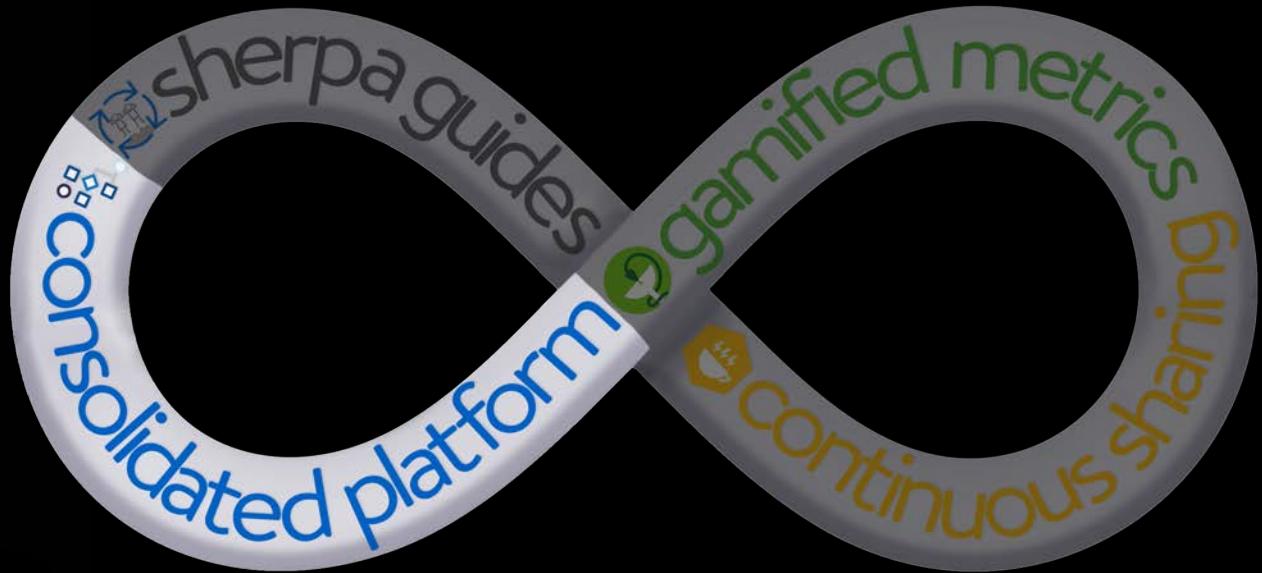
continuous chai





“You can be brilliant and still go out of business if you're too inefficient.”

-Sam Walton



Software Delivery & Enablement

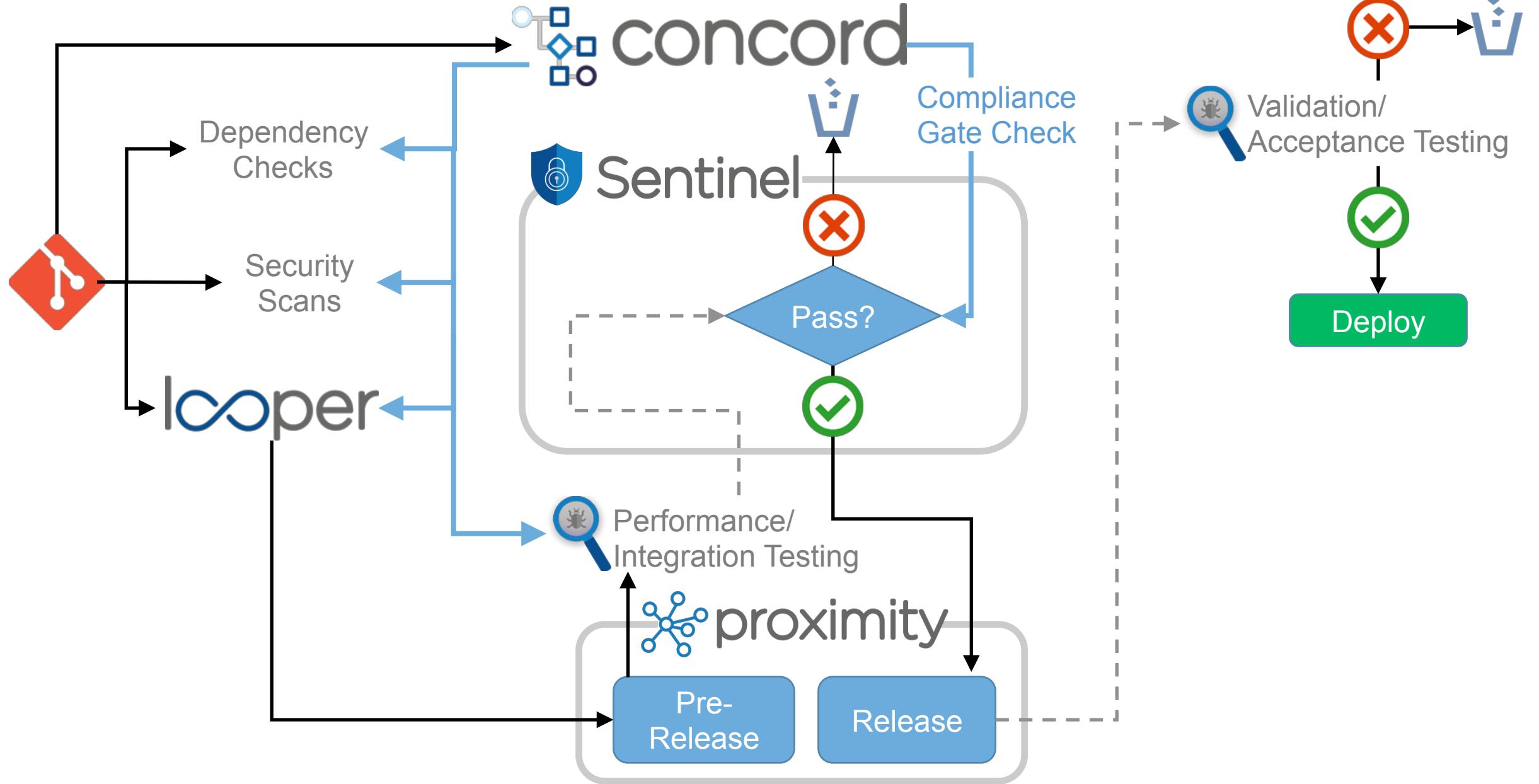
Delivery as a Service

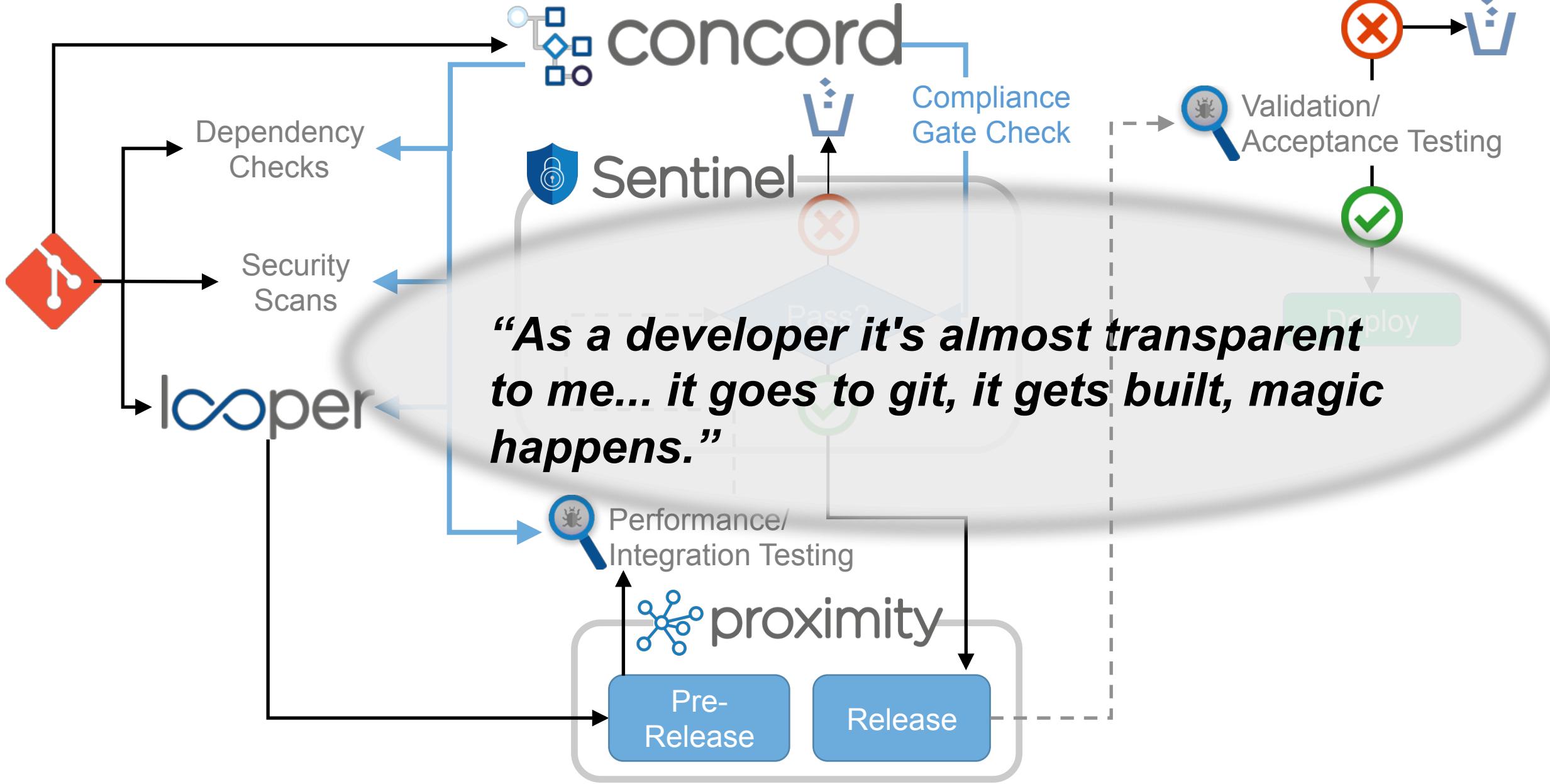
Open source tools at enterprise
scale

Making the right thing easy



Code more. Live better.



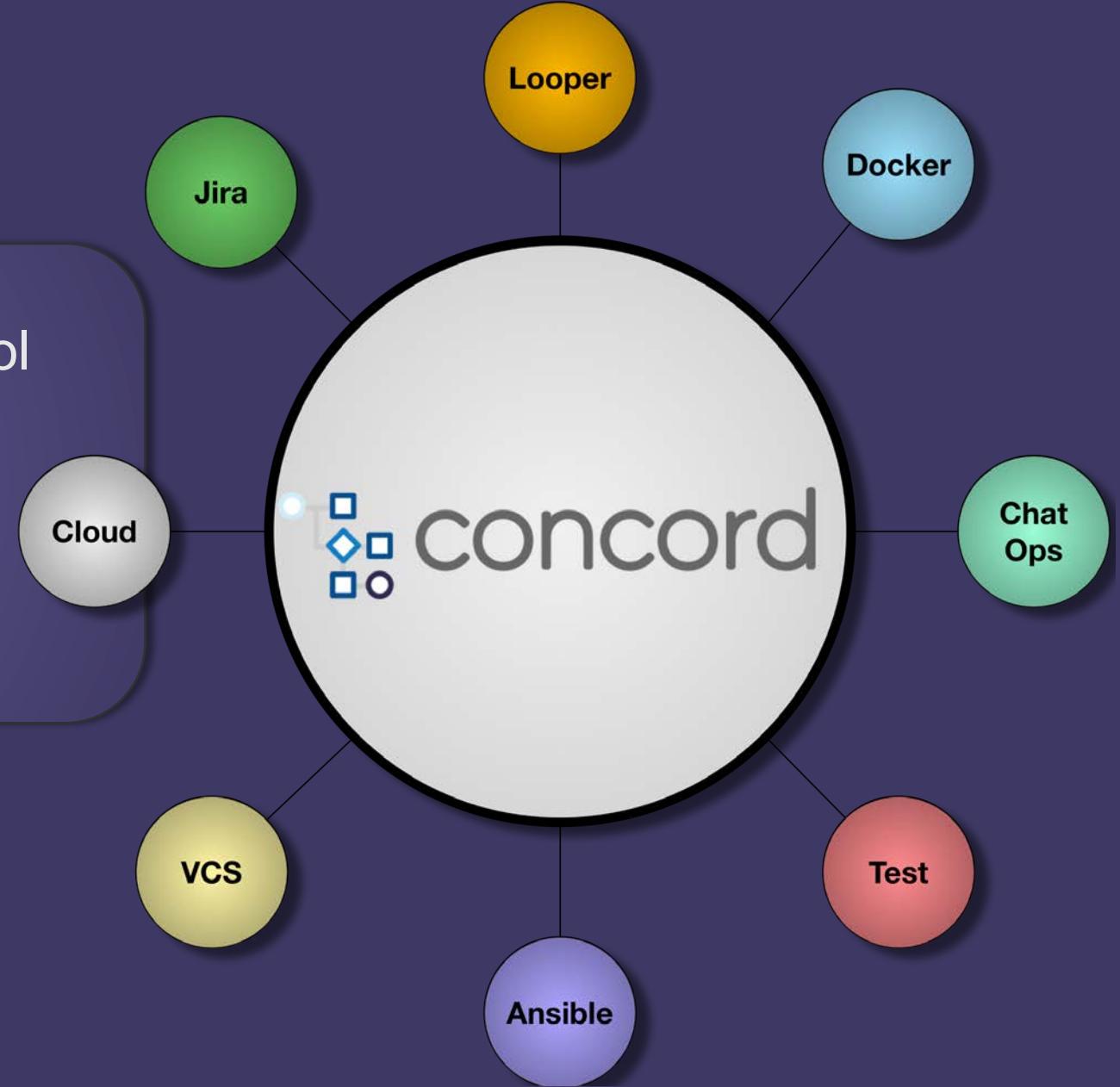


Workflow Orchestration

Plugins for every required tool

Easily extensible

Planned for open source



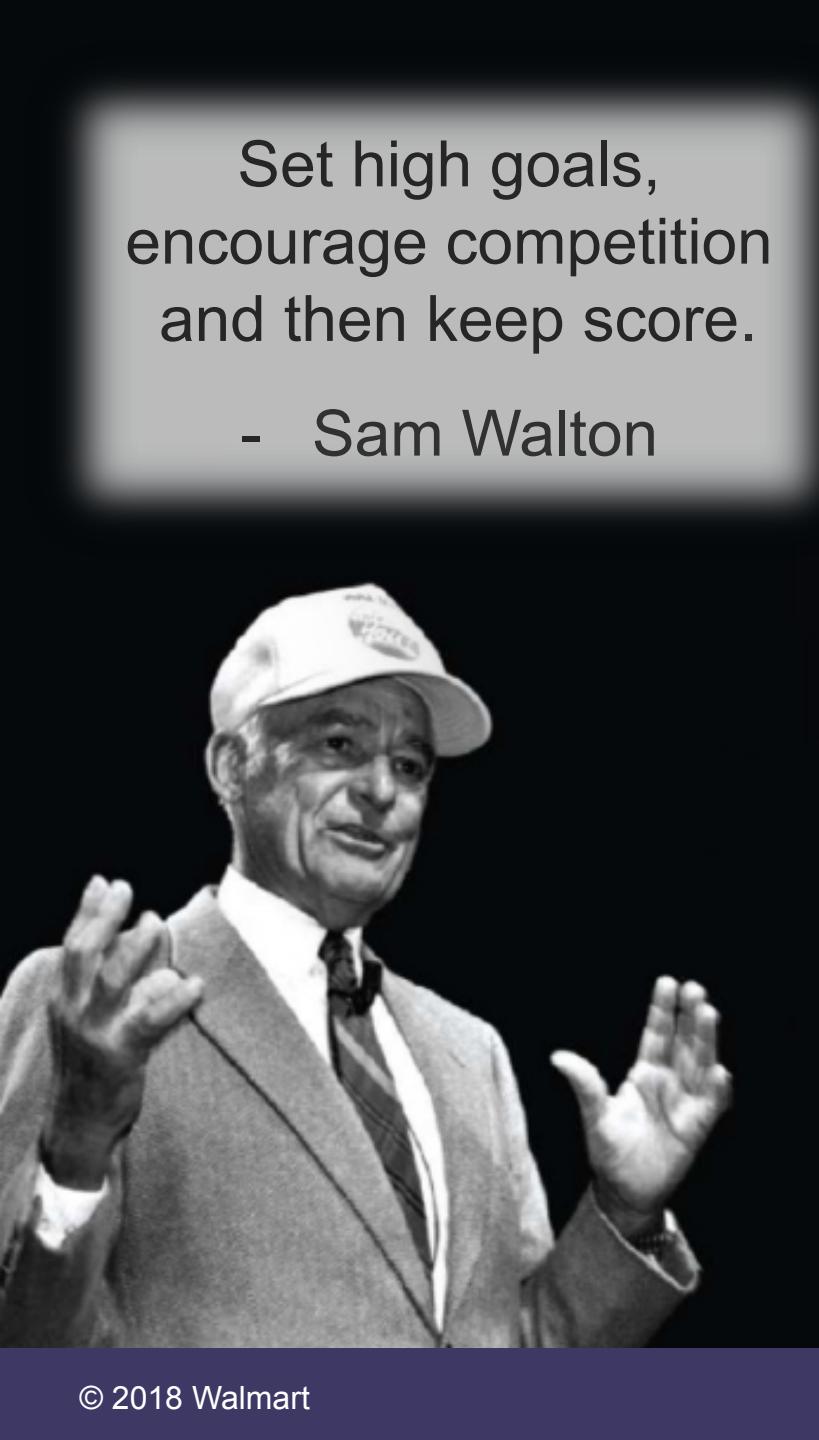
Make it Simple

```
1 tools:
2   jdk: 8
3   maven: 3.5.0
4
5 flows:
6   master:
7     try:
8       - mvn clean verify -Prun-its,coverage
9       - call: runsonar
10      - call: release
11    finally:
12      - call: hygieiaPublish
13 pr:
14   - mvn clean verify
15 test:
16   try:
17     - mvn clean verify -Prun-its,coverage
18     - call: runsonar
19   finally:
20     - call: hygieiaPublish
21 runsonar:
22   - sonar("sonar"):
23     - hygieia.publishBuild(-DSONAR_MAVEN_GOAL=mvn -B -fae -f pom.xml $SONAR_MAVEN_GOAL)
24
25 hygieiaPublish:
26   - hygieia.publishBuild()
27
28 release:
29   - exposevars(.release.properties)
30   - mvn release:perform -U -B
```

Declarative language

Co-located with code

Hide complexity



Set high goals,
encourage competition
and then keep score.

- Sam Walton





HYGIEIA

<https://github.com/capitalone/Hygieia>

DevOps dashboard

Near real-time view of CI/CD pipelines

Code health from commit to production

Score

28m ago

SCORE

VIEW DETAILS >

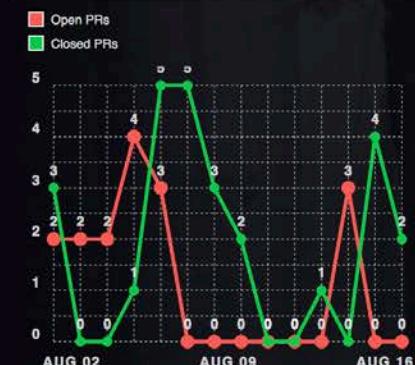
4.6



Code Repo

6

2h ago

[PRs](#) [Commits](#) [Branches](#)

Repo Averages

# PRs Still Open	0
# PRs Closed w/o Merge	0
Avg time to Close a PR	0.92 day(s)
# Commits per PR	5
# Comments per PR	10.73
# Files Changed per PR	5.92

Build

3.9

9s ago

Builds Per Day

Average Duration

Total

BUILDS PER DAY



LATEST BUILDS

- ✓ 1256 2h ago >
- ✓ 1254 3h ago >
- ✓ 1245 1d ago >
- ✓ 1242 1d ago >
- ✓ 1241 1d ago >

Teamrosters

25m ago

NEXT-GEN-DC-RECEIVING

VIEW DETAILS >



6 Associates, 3 Contractors

Deploy

2h ago

DEPLOYS PER DAY



ENVIRONMENT STATUS

Proximity 3h ago 1 ↑ 0 ↓

0

TECHNICAL DEBT

CODE COVERAGE



Score

28m ago

SCORE

VIEW DETAILS >

4.6



Code Repo

2h ago

PRs Commits Branches



Repo Averages

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✓ 1242	1d ago	
✓ 1241	1d ago	

Teamrosters

25m ago

NEXT-GEN-DC-RECEIVING

VIEW DETAILS >



6 Associates, 3 Contractors

Deploy

2h ago

DEPLOYS PER DAY



ENVIRONMENT STATUS

Proximity 3h ago 1 0

0
QUALITY GATE
VERSION 1
TECHNICAL DEBT

UNIT TESTS

Success 100.0%
Failures 0
Errors 0
Tests 446

CODE COVERAGE



Score

28m ago

SCORE

VIEW DETAILS >

4.6

Build 3.9

9s ago

Builds Per Day Average Duration Total

BUILDS PER DAY



LATEST BUILDS

1256	2h ago	
1254	3h ago	
1245	1d ago	

Teamrosters

25m ago

NEXT-GEN-DC-RECEIVING

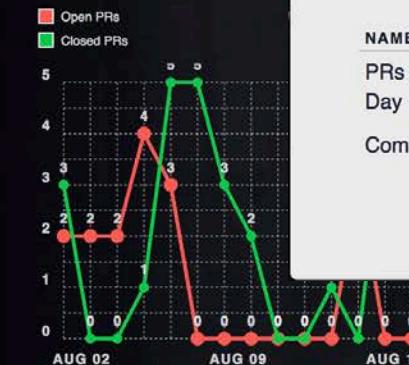
VIEW DETAILS >



6 Associates, 3 Contractors

Code Repo 6

PRs Commits Branches

**✓ GitHub SCM Score Details****5**

NAME	STATUS	MESSAGE	WEIGHT	SCORE
PRs Merged Per Day	Criteria Passed	Data is present for more than or equal to 60% of last 14 days	70%	
Commits With PR	Processed		30%	

Repo Averages

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CRITICAL
MAJOR
ISSUES

UNIT TESTS

0
0
0

GATE

0
0
0TECHNICAL
DEBTSuccess
Failures
Errors
Tests100.0%
0
0
446

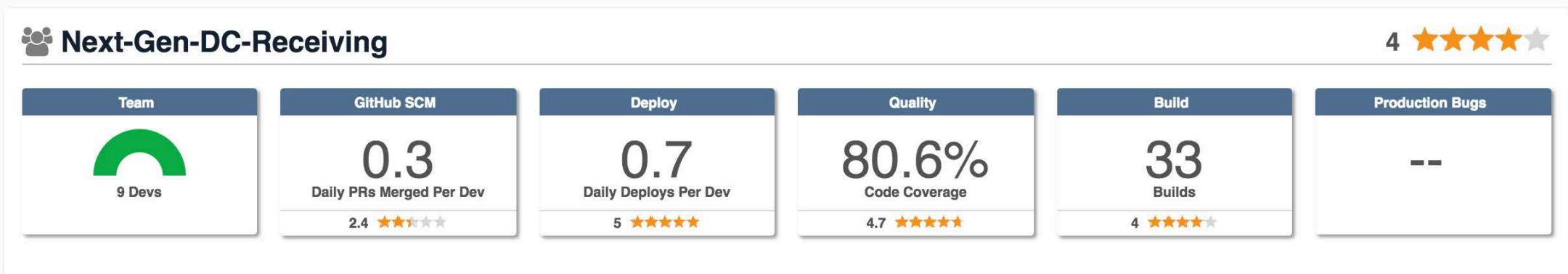
CODE COVERAGE



Hacking the Biggest Undocumented API

People are unpredictable
Metrics are tricky
Pay attention to outcomes

Teams Report > Next-Gen-DC-Receiving



Dashboard Name	Pillar	Project	Score
ReceiveApp	RT-Distribution	Next-Gen-DC-Receiving	4.6 ★★★★★
Receive	RT-Distribution	Next-Gen-DC-Receiving	4 ★★★★★
build receiving container	RT-Distribution	Next-Gen-DC-Receiving	2.4 ★★★★☆

“Do it. Try it. Fix it.”

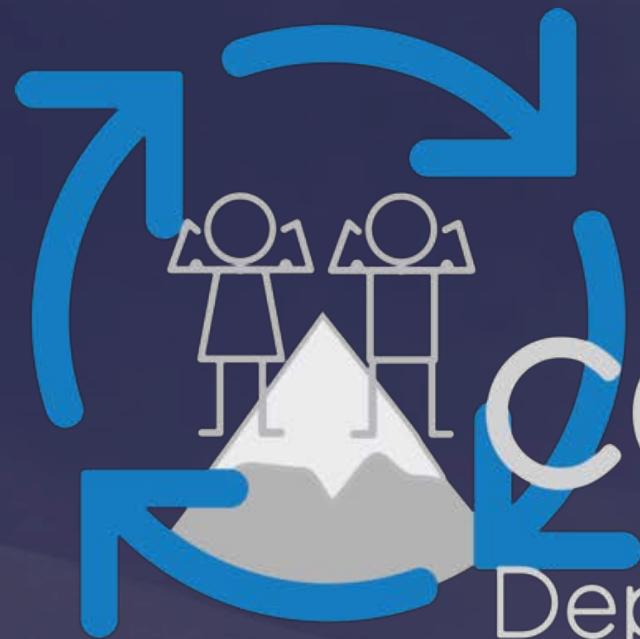
-Sam Walton



Tech workshops

Leadership outreach

Team boot camps



cd sherpa

Deploy More. Sleep Better.

Wide Set of Topics

TO DO

Operational monitoring

IN PROGRESS

?

zybs! REVIEW

2

DONE

Domain driven design

Evolutionary Architecture

Legacy strangulation

Feature decomposition

Pragmatic agility

Test suite design

Test driven development

CI team process

Cloud architecture

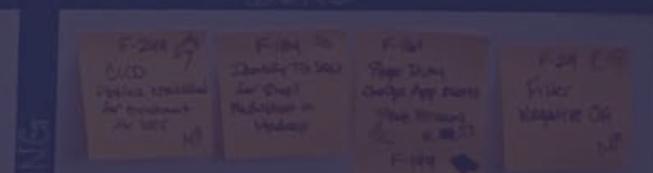
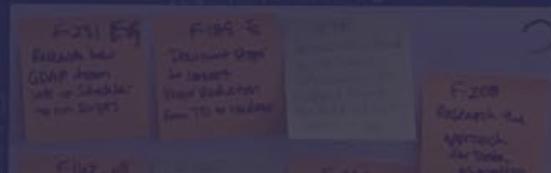
Behavior driven development

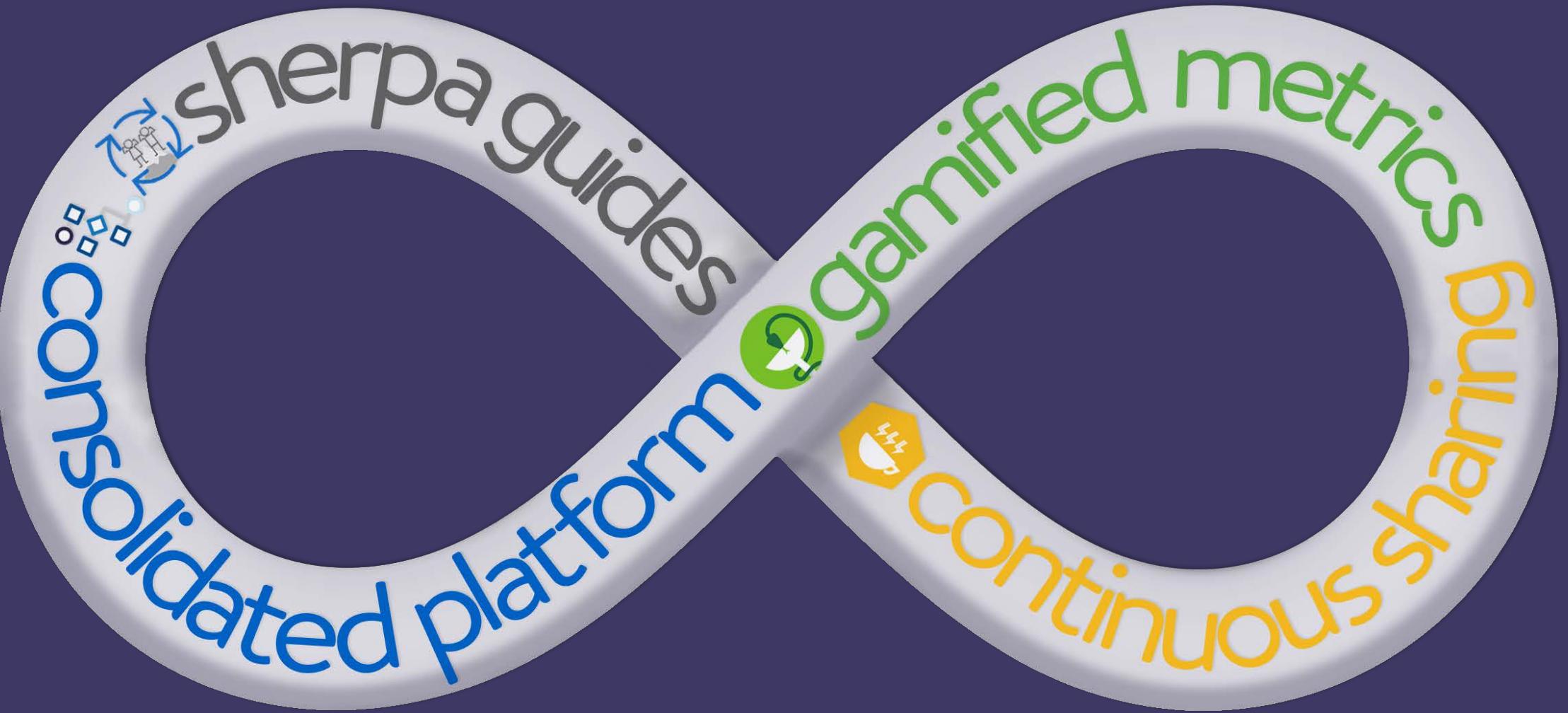
TO DO

IN PROGRESS

REVIEW

DONE





Context Matters

Leverage your culture

Use what works in yours

Give people permission!

Looking for Help

Effective ways of onboarding non-technical stakeholders

Outcomes

More collaboration

Accelerating delivery with higher quality

Improvement is addictive

Teams having more fun





DEPLOY!!!!!!

Managed Tomcat
Version Release



Walmart Labs
careers.walmart.com