



The Power of DevOps in the Real World

Randy Pagels
DevOps Architect | Xpirit USA



Let's connect



Randy-Pagels



@RandyPagels



PagelsR



<https://xpirit.com>

<https://qrco.de/beHAED>

Let's connect!



SCAN ME



Randy Pagels

DevOps Architect

rpagels@xpirit.com

SAVE THE DATE

.NET Conf 2023

November 14 – 16

.NET 8 GA launch

80+ live sessions, 24-hr continuous broadcast

Live Q&A, games, prizes, digital swag



www.dotnetconf.net

GitHub Universe 2023

Save the Date

Beyond Code: The global developer event!!!

November 8-9, San Francisco, CA and streaming on

<https://www.githubuniverse.com/>

On Demand

Wherever you are on your GitHub journey, our stacked catalog of on demand sessions will help you dive deeper. Register for free access to the full library.

Interactive

Get hands on with the people who write the code that helps you build what you want through demos, Q+As, and roundtables. Register for free to save your spot.

[GitHub Universe - November 8-9, 2023](https://www.githubuniverse.com/)

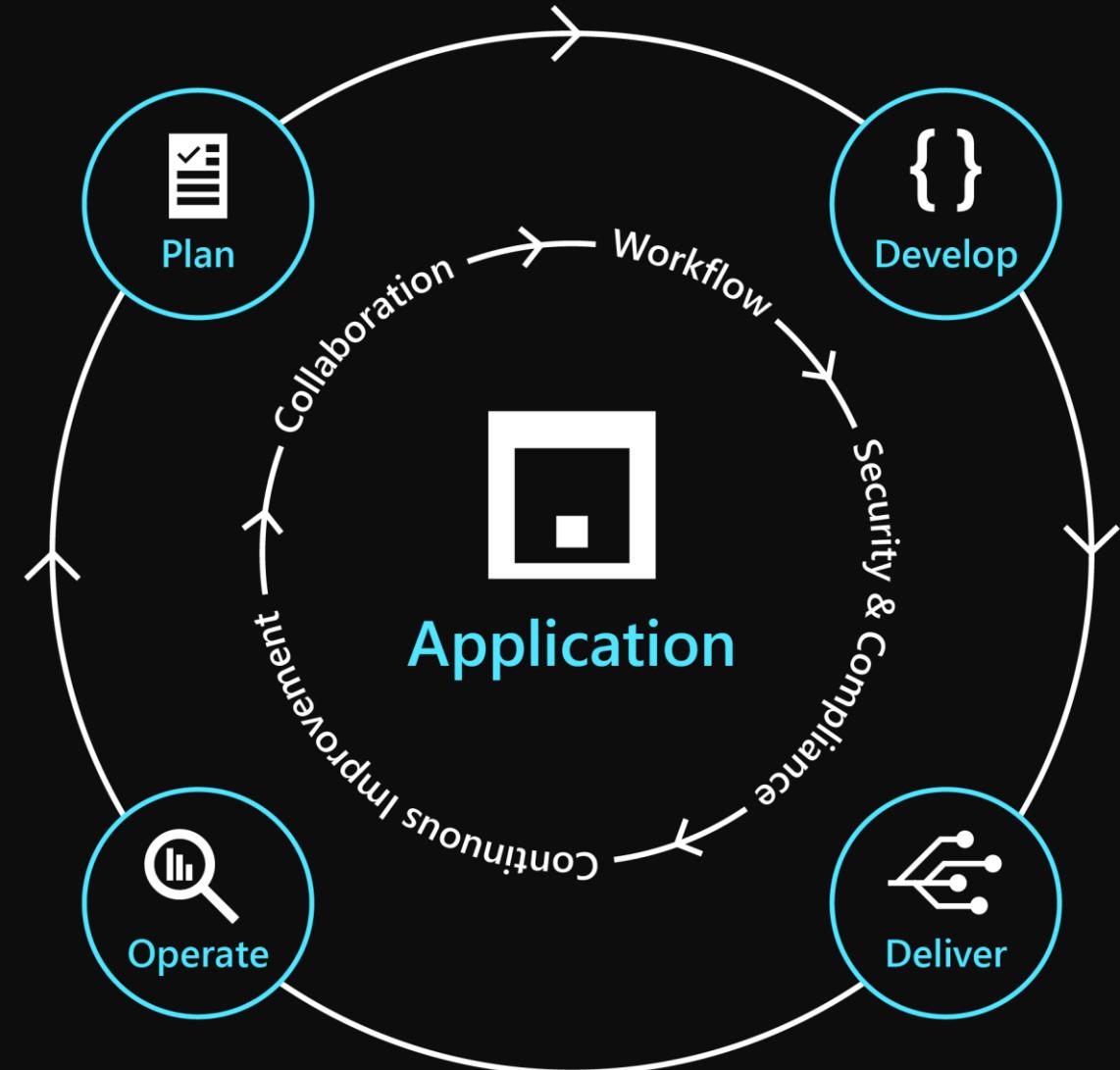


What is DevOps?

“

DevOps is the union of **people**,
process, and **products** to
enable continuous delivery of
value to your end users.”

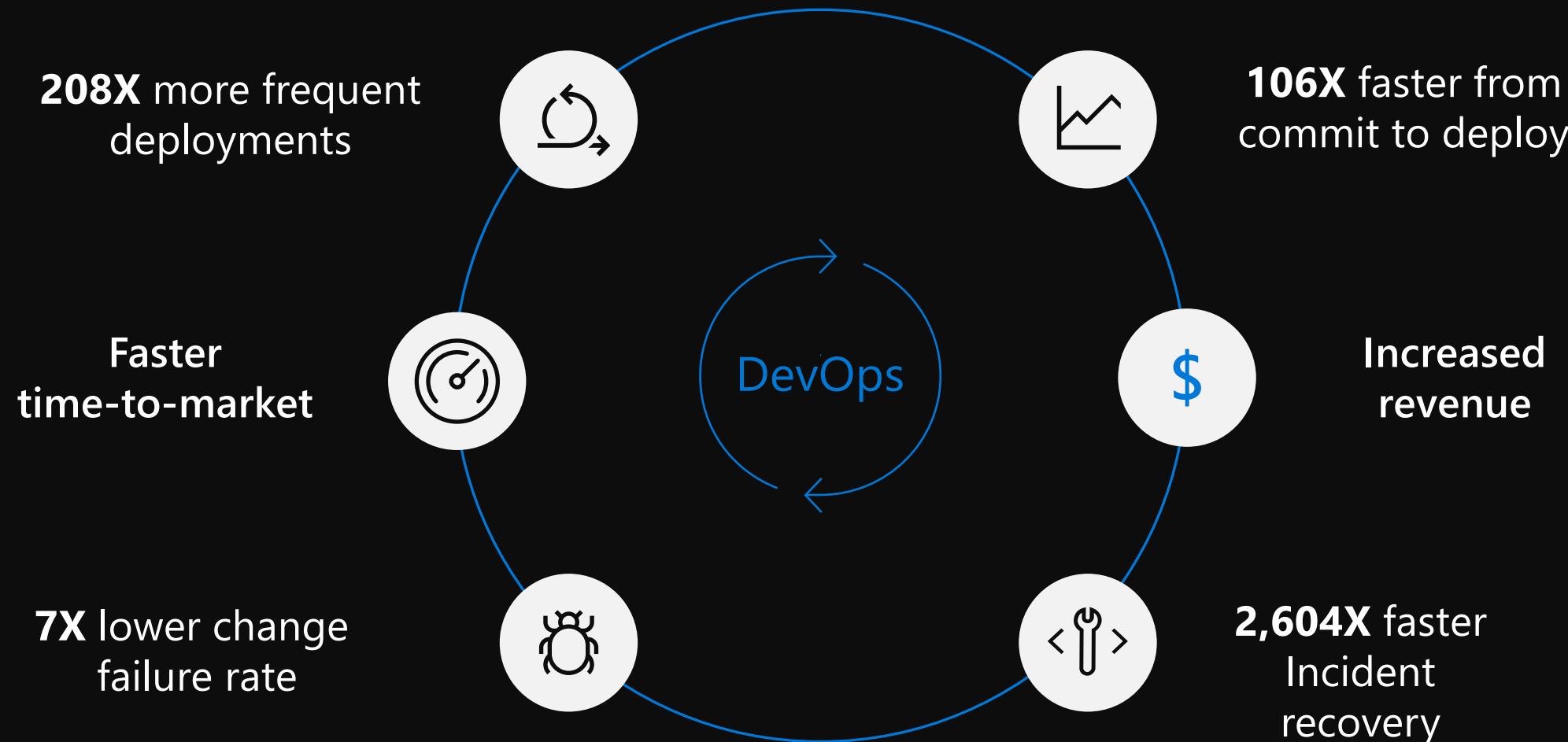
- Donovan Brown



Why is DevOps important?

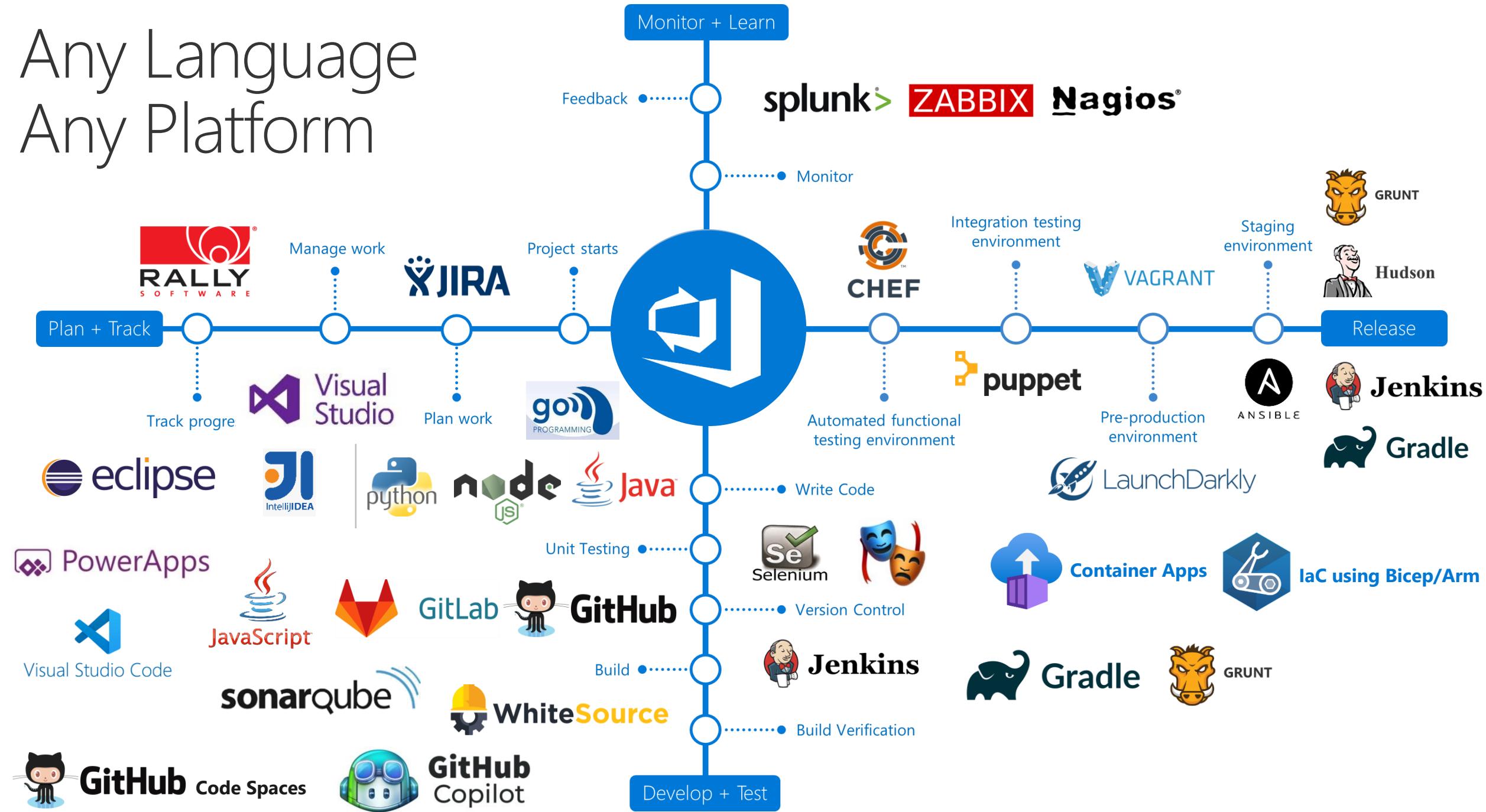
- Your competition is already doing this
- Increase velocity
- Reduce downtime
- Reduce human error

High performance DevOps companies achieve...



Source: 2019 Accelerate State of DevOps Report by DORA and Google Cloud DevOps & SRE

Any Language Any Platform



DevOps in the Real World



Real World Apps Example



- Microservice Based
- REST APIs
- ASP.NET / React Front end / WinForms / IoT
- SQL Server DB / CosmosDB
- Secret Management & Key Rotation
- Secure Login / MFA
- Configuration Management
- Hosting Containers >>> Kubernetes
- iOS and Android Mobile App

Real World Problems in Apps

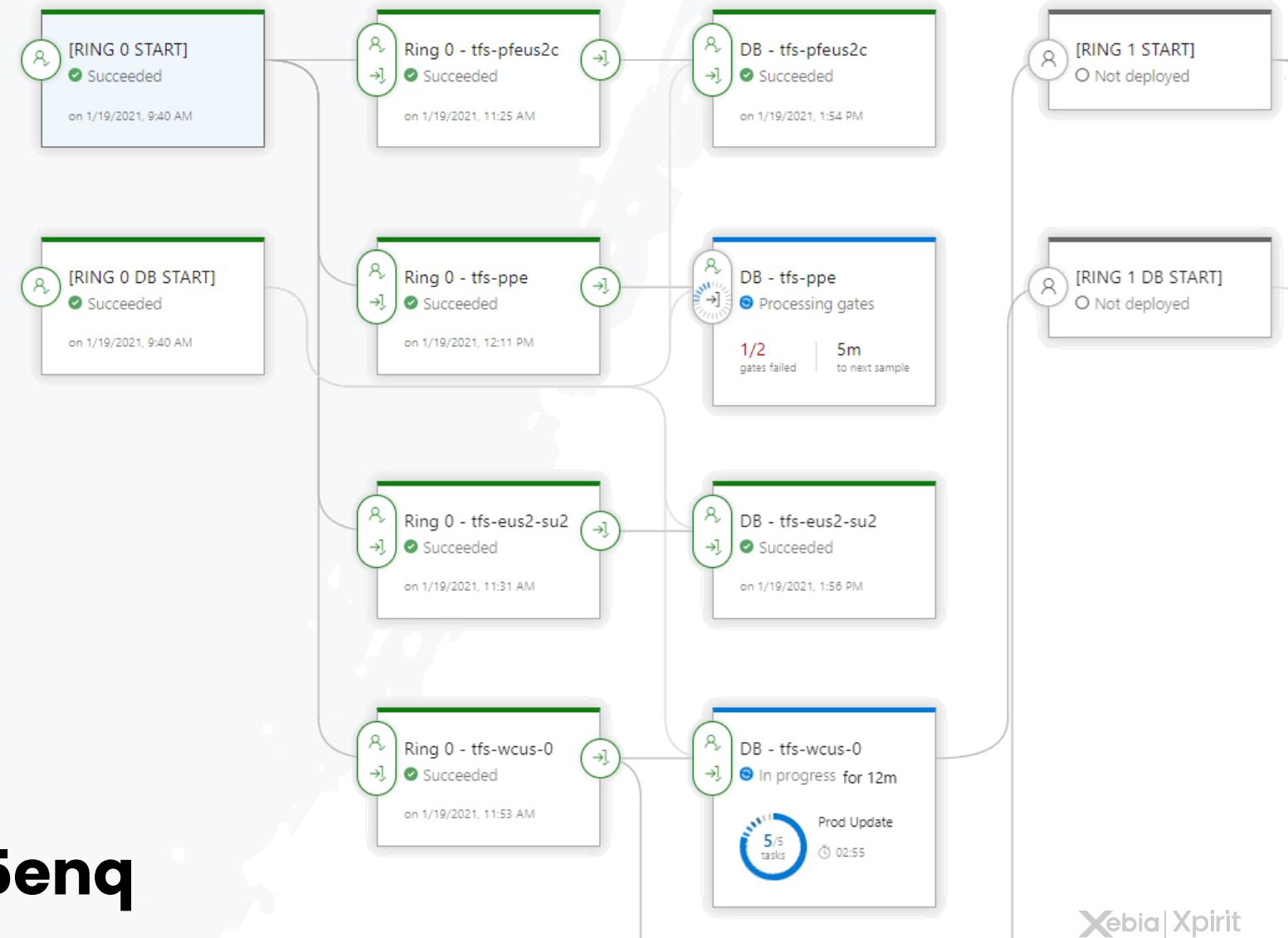


- Not ready for real microservice deployments
- Infrastructure is painful to spin up and configure
- Microservice architecture - difficult under single url
- Database Schema changes
- Testing on Multiple devices - Mobile DevOps
- Maintaining Quality, Performance Testing, Scalability
- Connection Strings and Secret Management
- Setting up DNS, HTTPS and Certificates
- Monitoring and Logging
- Security In DevOps (DevSecOps)

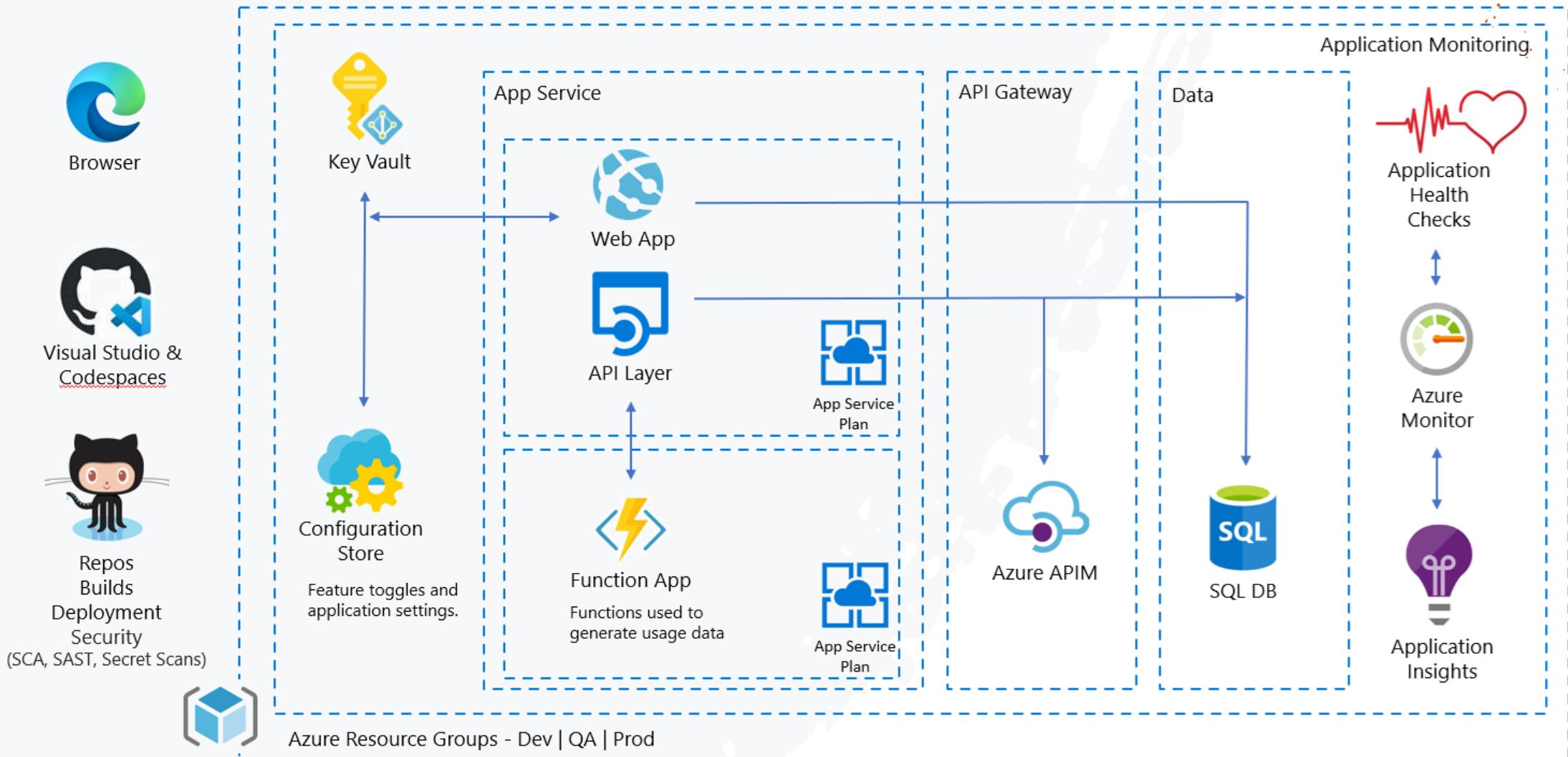
DevOps Nirvana



Blog part 1
<https://aka.ms/AAh5enq>



Application Architecture



DevOps Nirvana



Mercury Health Home Nutrition Exercises Privacy Metrics

Welcome to Mercury Health

The mission of Mercury Health is to help improve longevity and quality of life through healthy activity.

Think Positive! Stay Focused! Breathe! Be Awesome!

Environment: **dev**

Total visits: 7 | Last visit: **Saturday, August 26, 2023 12:00 PM**
App Settings from App Configuration - Website_FontName: **Calibri**, Website_FontColor: **Black**, Website_FontSize: **14**

Exercise

Physical activity is a very important part of a healthy lifestyle. Our advanced tracking tools enable two-way auto syncing with all the popular activity trackers.

[Create Exercise](#)

Nutrition

A well crafted diet can help you accomplish your health goals. Start logging all your meals with our logging tools. We combine the power of AI to enable food and activity loggin faster and easier.

[Create Nutrition](#)

Metrics

Nutrition Metrics can help you lose weight and have more energy. The Metrics dashboard is a collection of health stats across your Nutrition and Exercise activity.

[View Metrics](#)

© Copyright 2023 |  Mercury Health is powered by .NET 6.0.19 | Build 1.3.602.21137 | Saturday, August 26, 2023 at 11:44 AM | [Privacy](#)

<https://github.com/pagelsr/mercuryhealth>

Xebia | Xpirit

Developer First Security – Shift Left



Demo

DevOps at Microsoft

Azure DevOps is the toolchain of choice for Microsoft engineering with over 110,000 internal users

→ <https://aka.ms/DevOpsAtMicrosoft>

182K

Monthly Engaged
Users (MEU)

18.7M

Builds per month

3M

Work items
created per month

7.0M

Git commits
per month

3M

Test runs
per day

5.6M

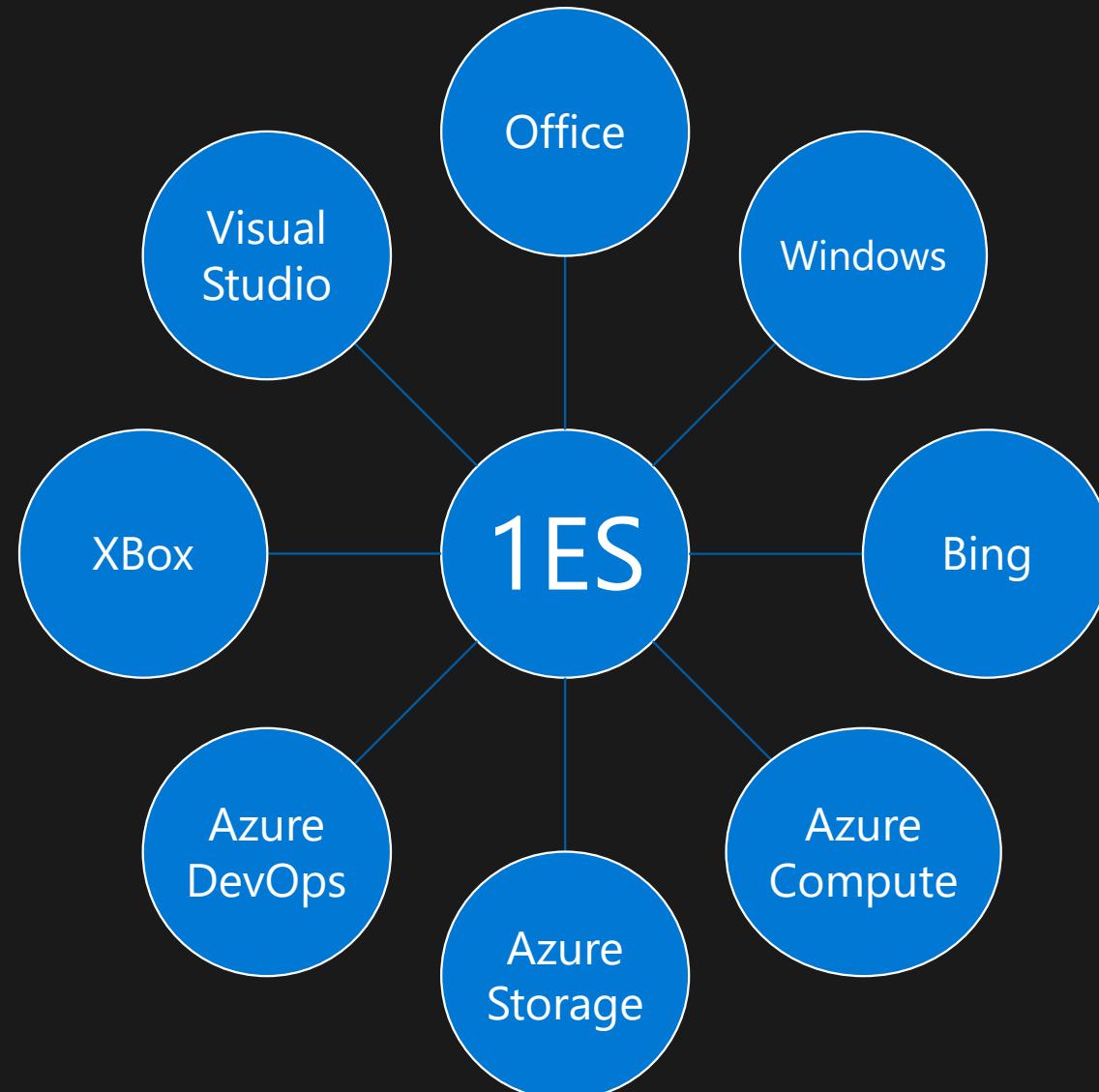
Work items
revised per month

5.2M

Releases per day

Data: Internal Microsoft engineering system activity, May 2023

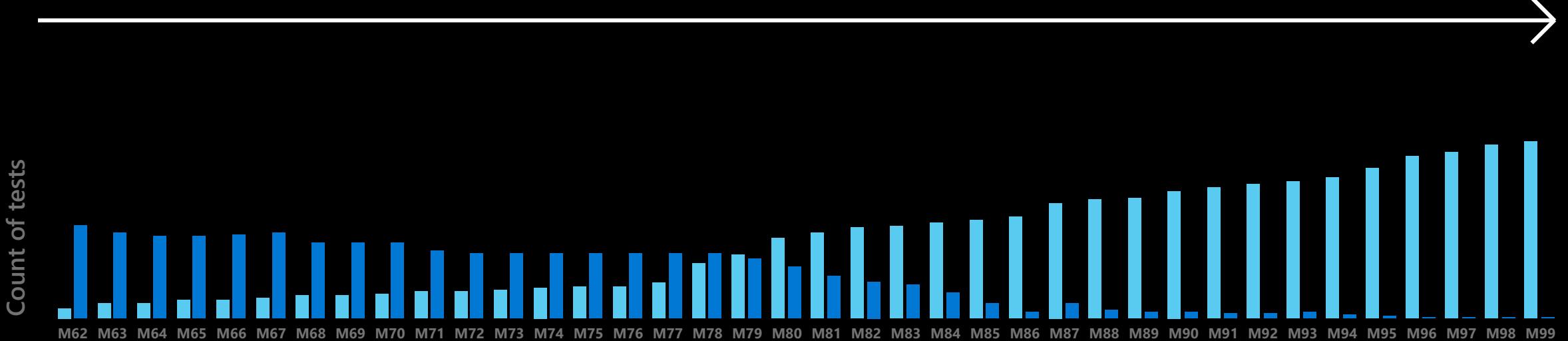
One Engineering System Landscape



Drive toward automation

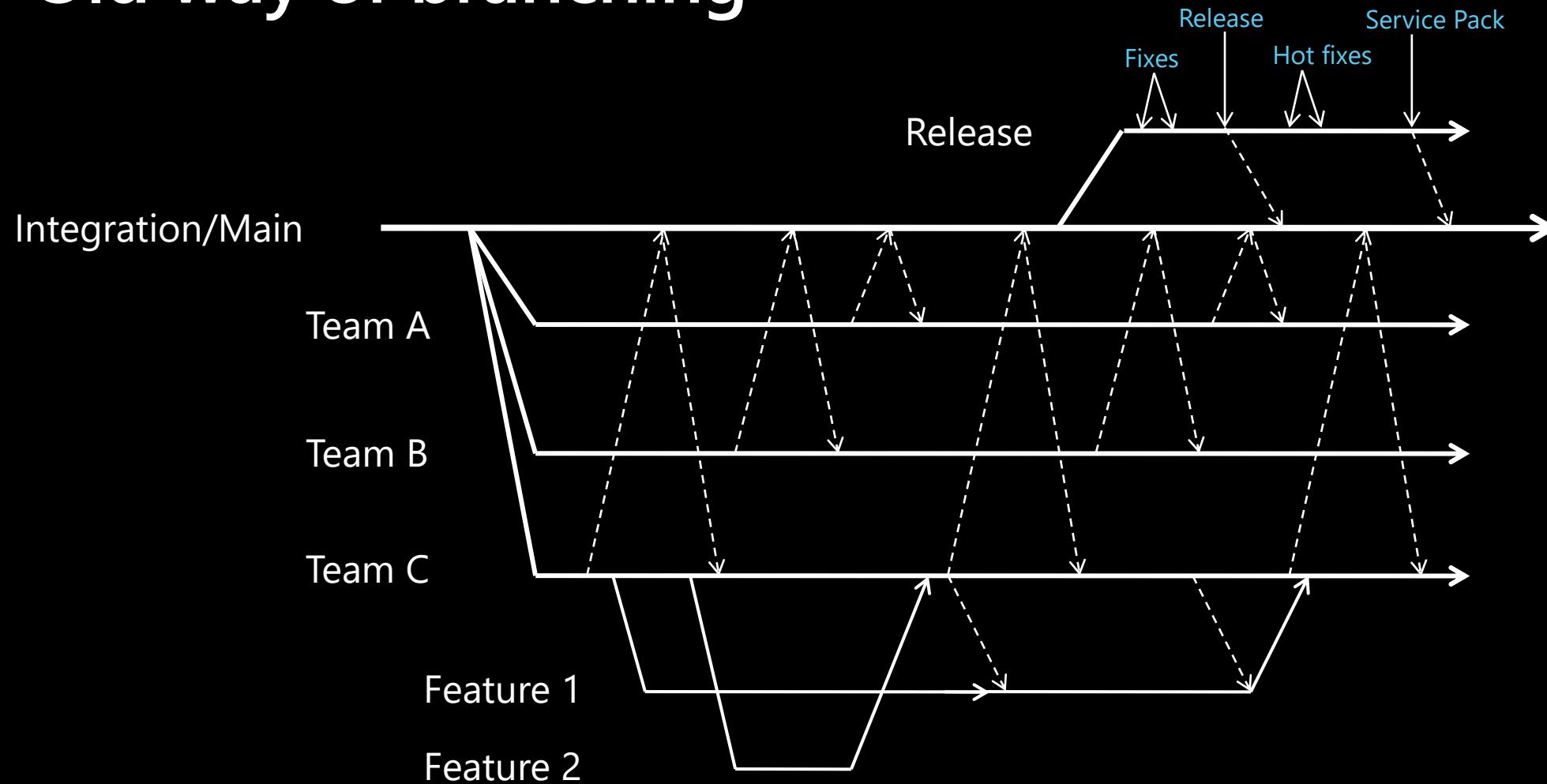
Long running
functional tests

Shifted to unit tests from
automated functional tests



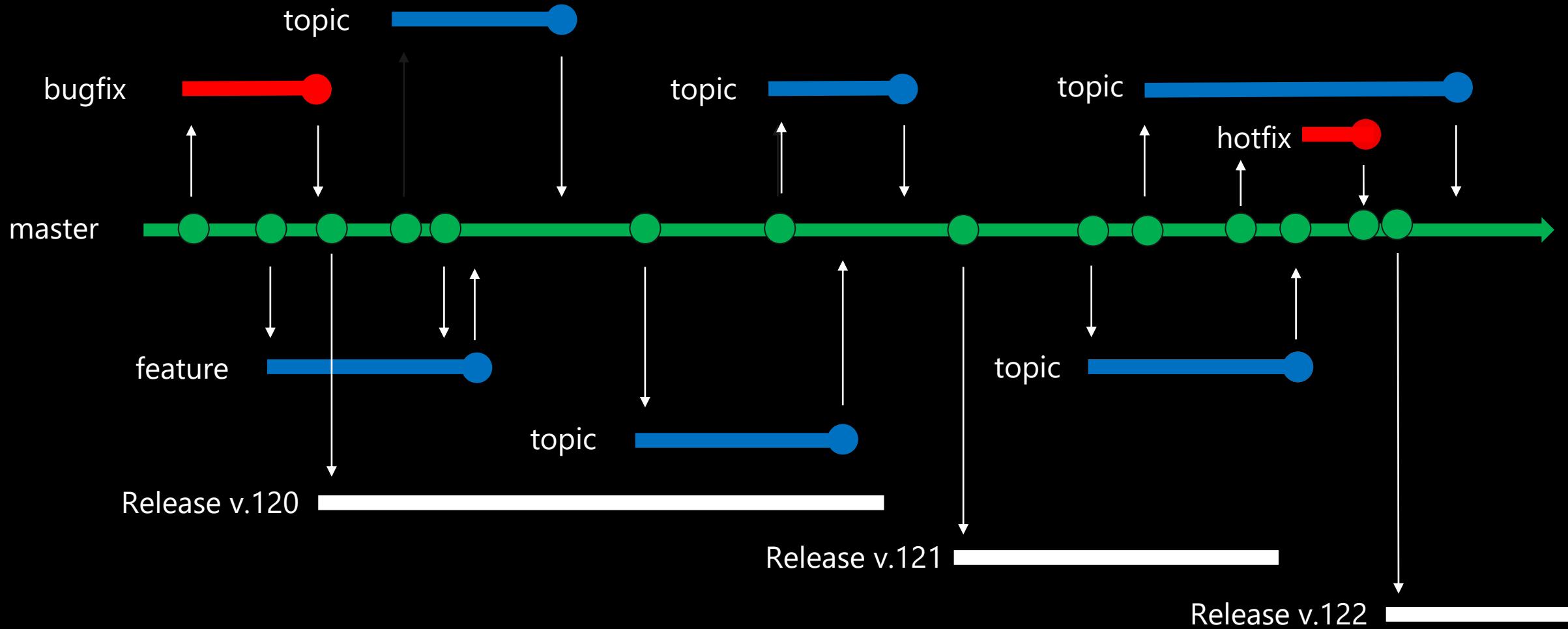
Composing Isolation Mechanisms

Old way of branching



Using Trunk Based Development to avoid Merge Debt

Release Flow

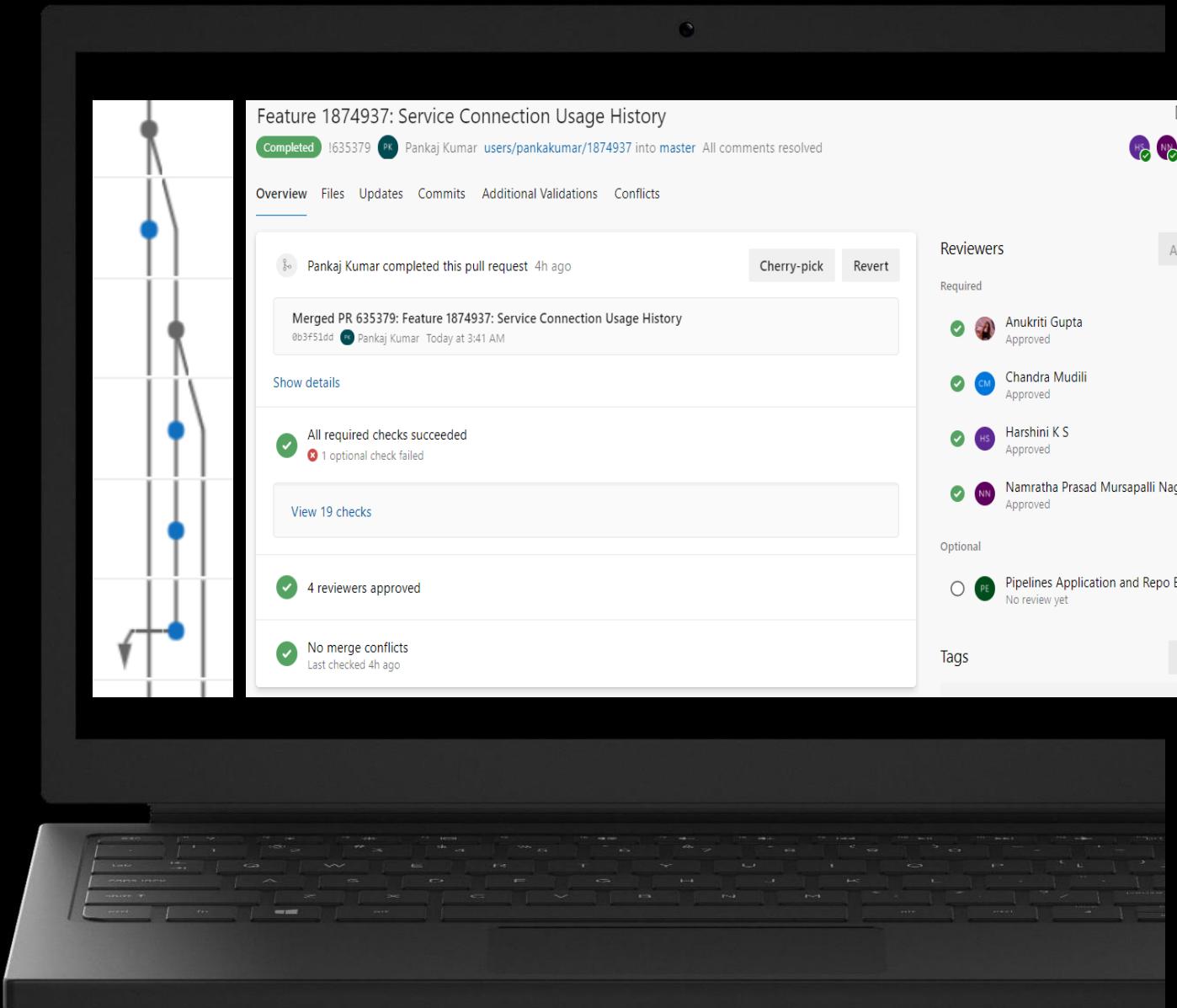


Utilize pull requests

Control changes

Pull requests are the first gate to control how changes get merged to the master.

Limit human error and ensure only high-quality code gets merged with detailed permissions, policies, and status checks.



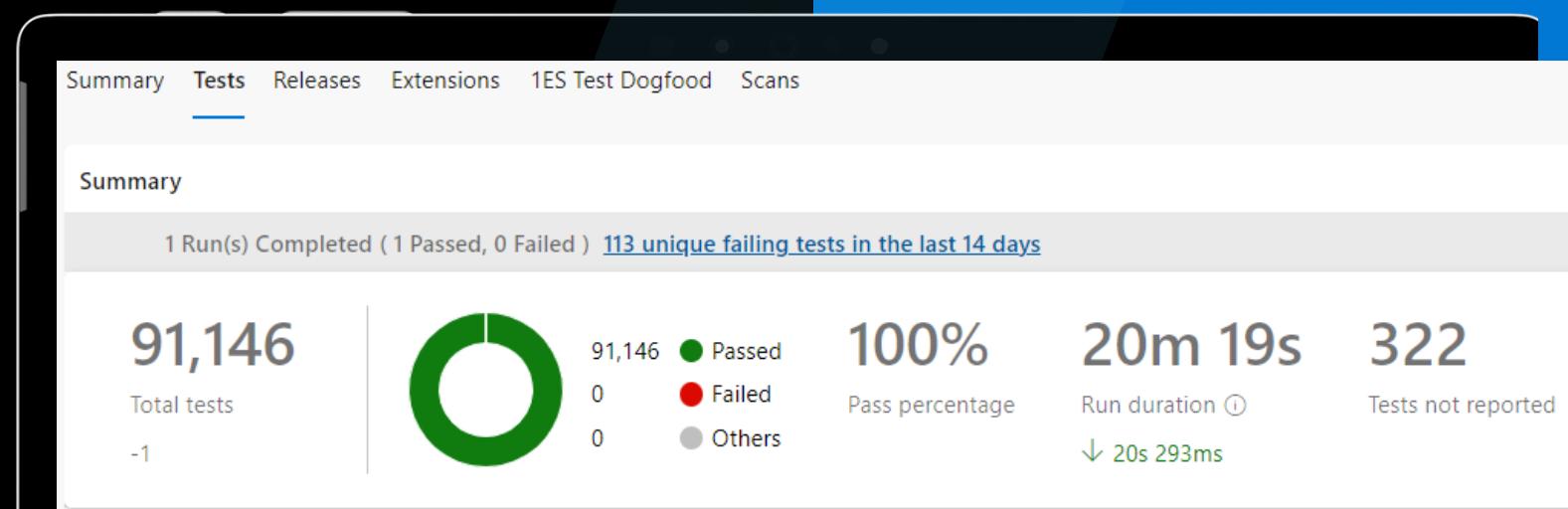
**Green means green,
red means red**

**Test control whether PR
can merge to the
master branch**

Core tests run before pull request is merged with a 100% pass required to advance.

Rolling tests continue to run in production.

ADO Unit Tests in the pipeline for past 14 days

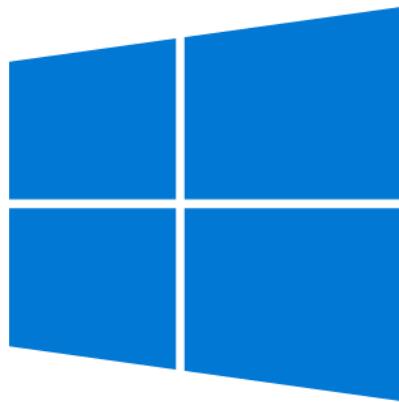


Progressively expose new releases

Deploy one ring at a time to monitor the impact of every deployment.



How Microsoft builds ...



Windows

...with Azure DevOps

Windows Team
22,000 SOFTWARE ENGINEERS



Software Products

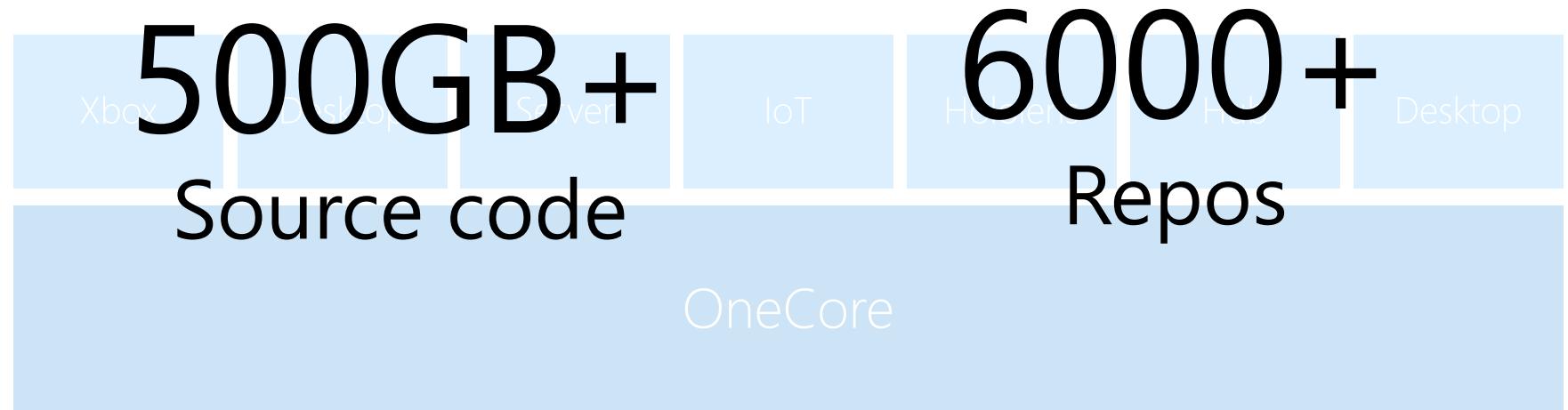
SERVICES



APPS



EDITION
SPECIFIC CODE



COMMON
OS CORE



DRIVERS

Scale

11,985	Software Engineers in WDG that need to work together
7,305	Developers bringing in code to WDG repos
3,974,374	Commits in Fall Creator's Update (RS3) development timeframe
497,903	Pull Requests for RS3
68,646	Official Lab builds for RS3
1,159	Machine years of build resources for RS3 Lab builds
4,201,457	Developer desktop RS3 builds
949	Machine years for test resources during RS3
3,188,972,675	Test cases executed during RS3

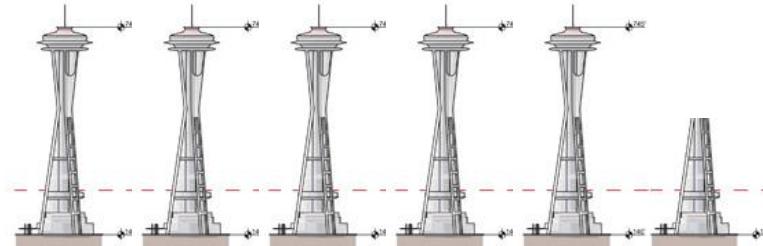
22,000 ENGINEERS CREATE A LOT OF STUFF...

11M

Work Items



If every one were a sheet of paper, it would be as tall as



5.5

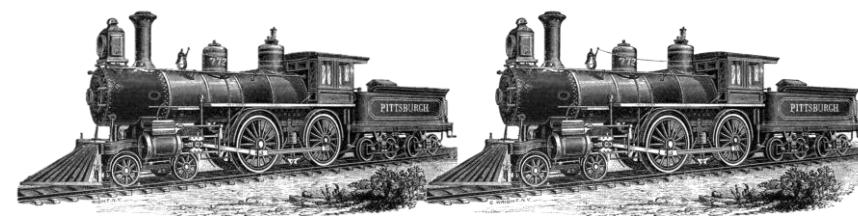
Space Needles

350M

Revisions



If every one were a feather, it would weigh as much as



2

Steam Engines

2.54M

Queries &
Updates /day



If every one were performed by a human, it would be the population of



Chicago
Illinois

Coding

On Average, Each Month

7,300 Developers making code changes

11,000 10 commits per minute

367,000 1,100 pull requests per day

33,000 Pull requests

9,700 Branch Integrations

Demo

DevOps Nirvana



Welcome to Mercury Health

The mission of Mercury Health is to help improve longevity and quality of life through healthy activity.

Think Positive! Stay Focused! Breathe! Be Awesome!

Environment: **dev**

Total visits: 7 | Last visit: Saturday, August 26, 2023 12:00 PM
App Settings from App Configuration - Website_FontName: Calibri, Website_FontColor: Black, Website_FontSize: 14

Exercise

Physical activity is a very important part of a healthy lifestyle. Our advanced tracking tools enable two-way auto syncing with all the popular activity trackers.

[Create Exercise](#)

Nutrition

A well crafted diet can help you accomplish your health goals. Start logging all your meals with our logging tools. We combine the power of AI to enable food and activity logging faster and easier.

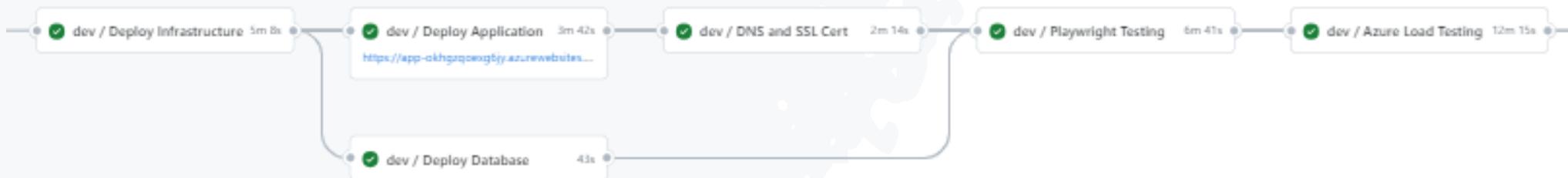
[Create Nutrition](#)

Metrics

Nutrition Metrics can help you lose weight and have more energy. The Metrics dashboard is a collection of health stats across your Nutrition and Exercise activity.

[View Metrics](#)

© Copyright 2023 |  Mercury Health is powered by .NET 6.0.19 | Build 1.3.602.21137 | Saturday, August 26, 2023 at 11:44 AM | [Privacy](#)

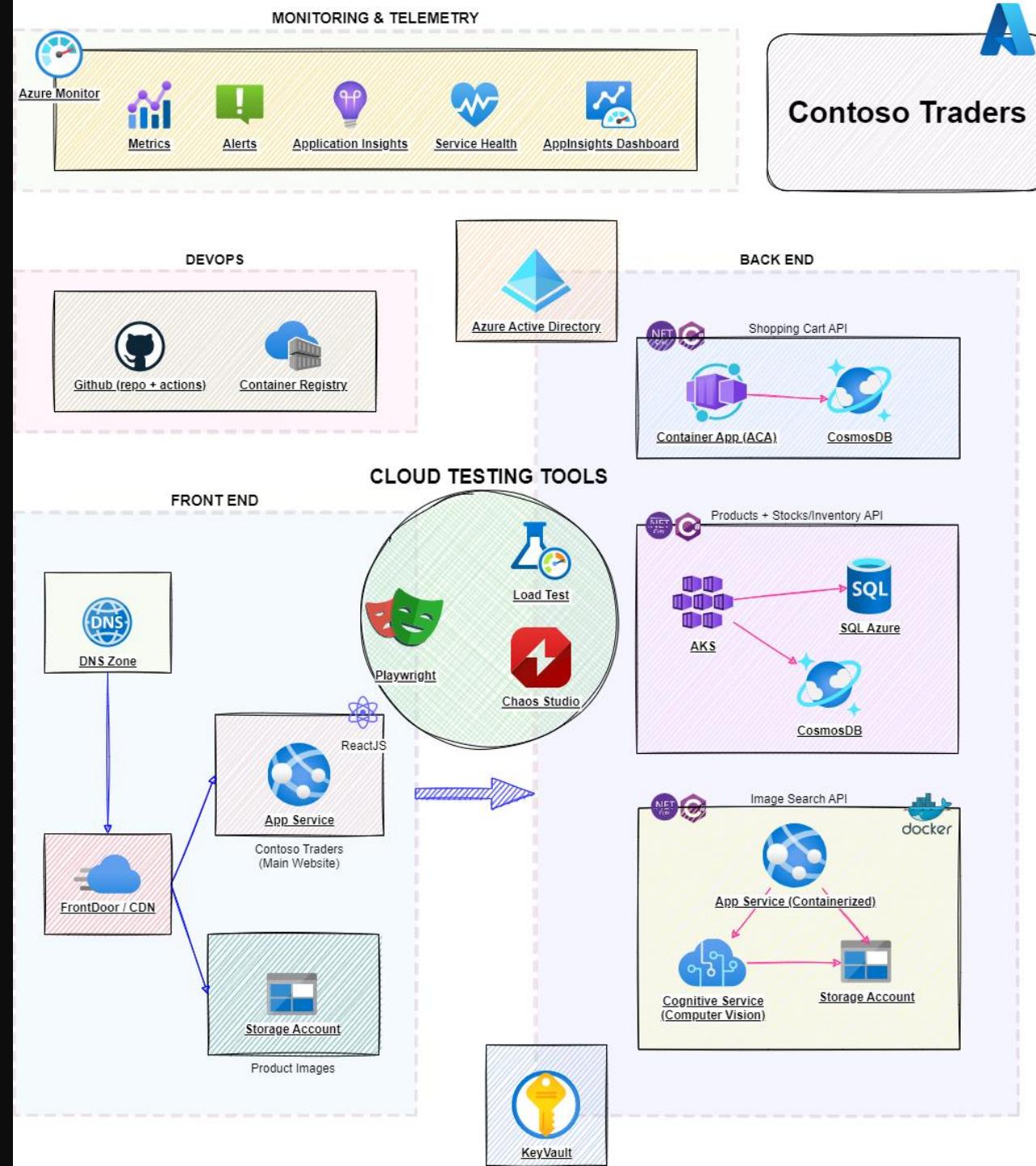


<https://github.com/pagelsr/mercuryhealth>

The Contoso Traders app

- ✓ IaC
- ✓ Active Directory
- ✓ DNS Zone
- ✓ Frontdoor / CDN
- ✓ App Service / React
- ✓ Container Apps
- ✓ CosmosDB
- ✓ SQL Server
- ✓ AKS
- ✓ Cognitive Service
- ✓ Application Insights
- ✓ Playwright
- ✓ Azure Load Testing
- ✓ Azure Chaos Studio

[https://github.com/microsoft/
contosotraders-cloudtesting](https://github.com/microsoft/contosotraders-cloudtesting)



Resources

Developer Velocity – <https://aka.ms/DevOps/DeveloperVelocity>

The DevOps Lab – <https://aka.ms/DevOpsLab>

Microsoft Learn – <https://aka.ms/MSLearn>

DevOps Blog – <https://aka.ms/devopsblog>



Thank you!