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Microsoft Azure Virtual Training Day: DevOps with GitHub



Getting Started with DevOps



Who is Tailwind Traders?



Experiencing rapid growth



Differing goals across teams



Need for better collaboration



Looking to Implement

- DevOps methodology
- Better communication tools
- Shared tooling

Agenda



What is DevOps?



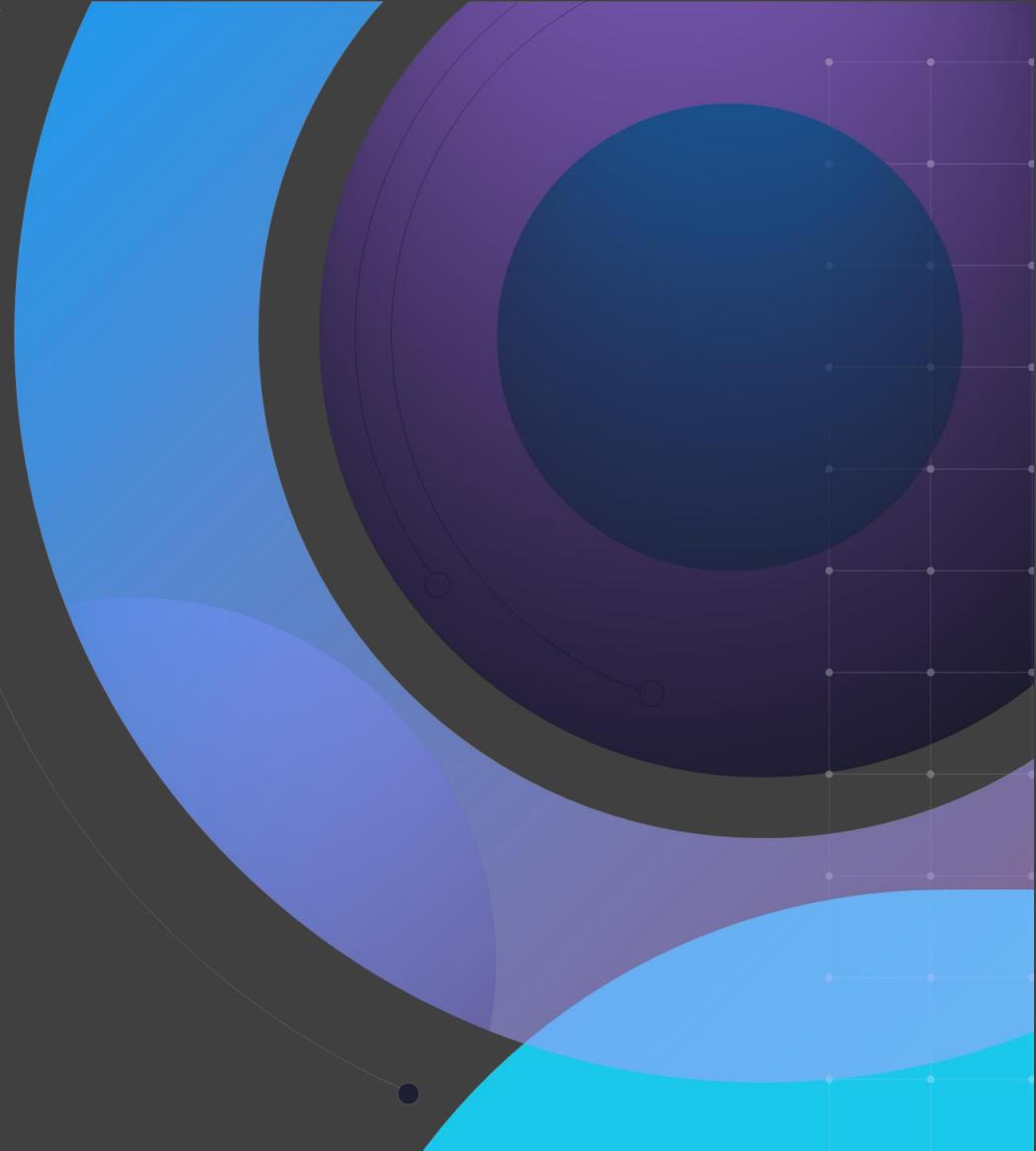
Source Control: Introduction to Git and GitHub



Using Microsoft Teams as a Collaboration Hub



Extending DevOps with Visual Studio Code



What is DevOps?

DevOps Accelerates Delivery

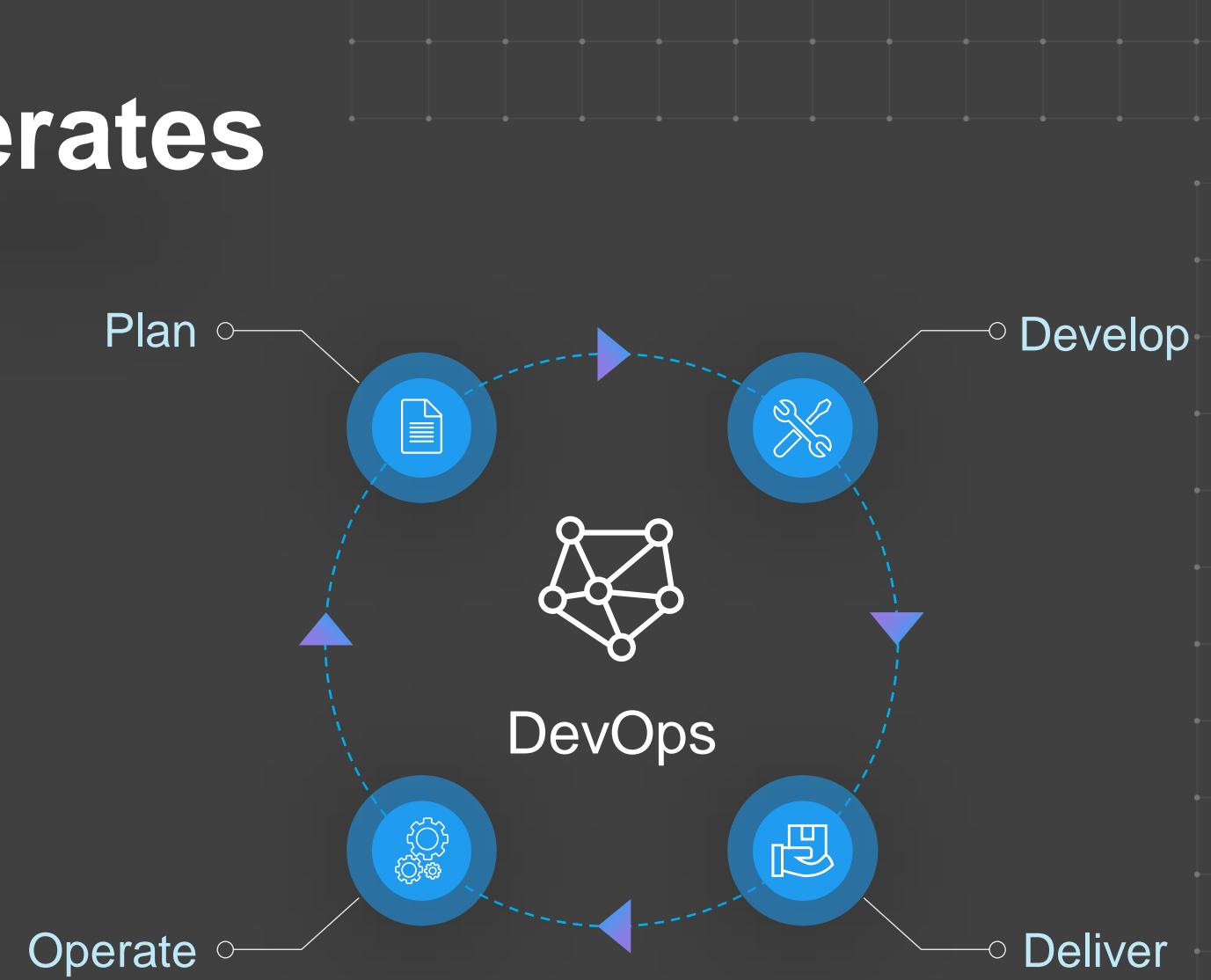
“

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

– Donovan Brown

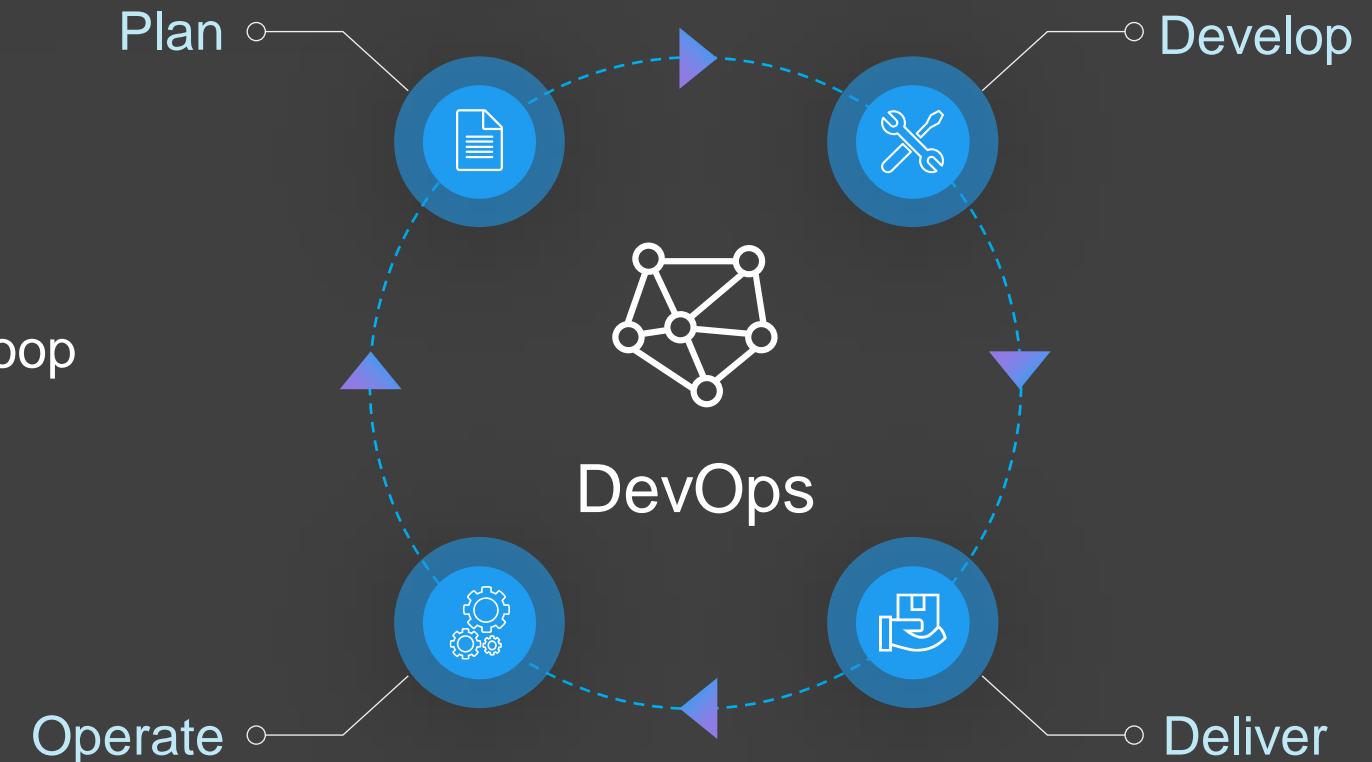


[Learn about What is DevOps](#)



What does this all mean?

- Deliver value
- Increasing efficiency
- Eliminating waste
- Streamline the feedback loop
- Continuously improve
- Deliver faster
- Happier customers



High Performance DevOps Companies Achieve Developer Velocity by...



Source: 2019 DORA

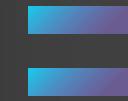
People



DEV

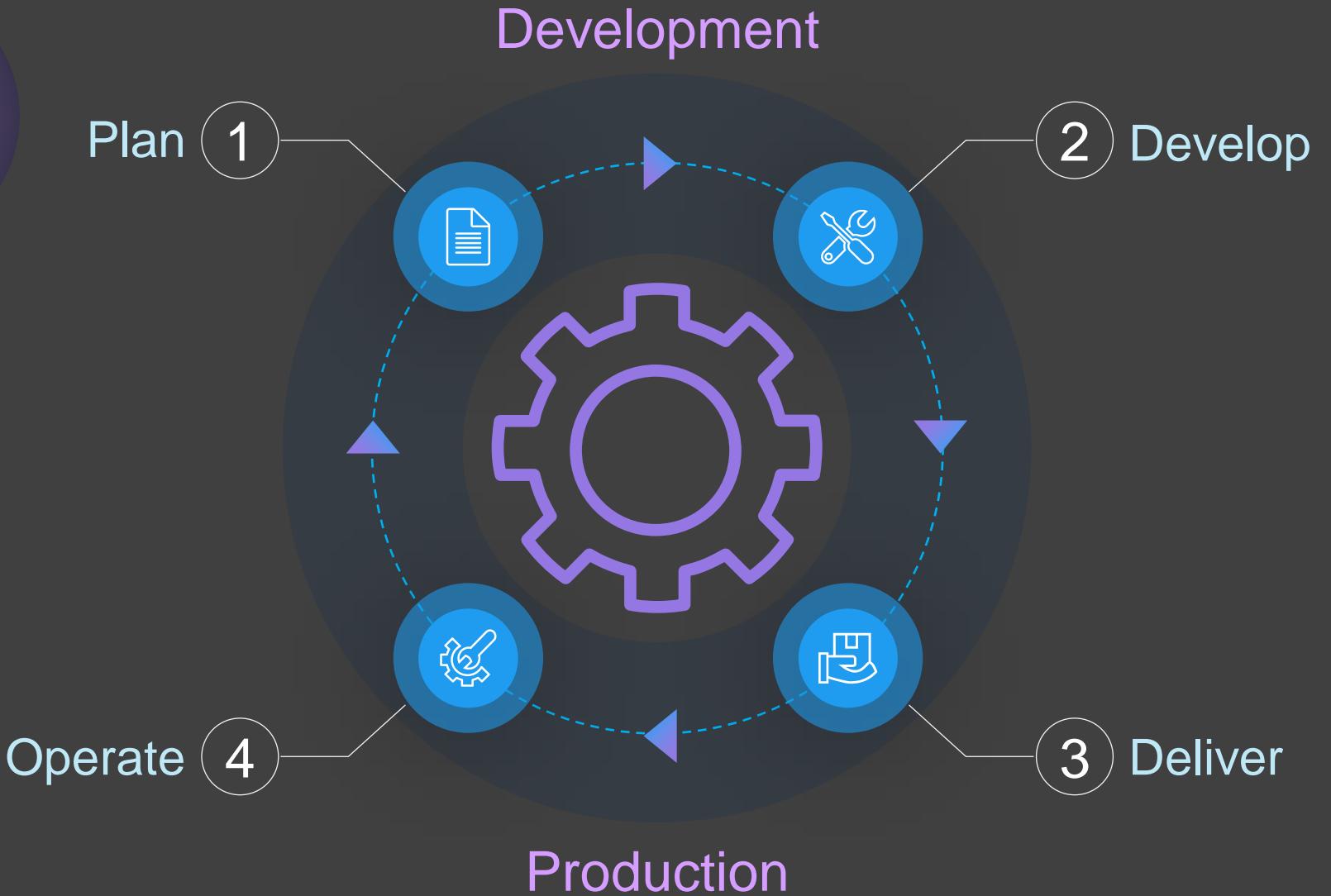


OPS

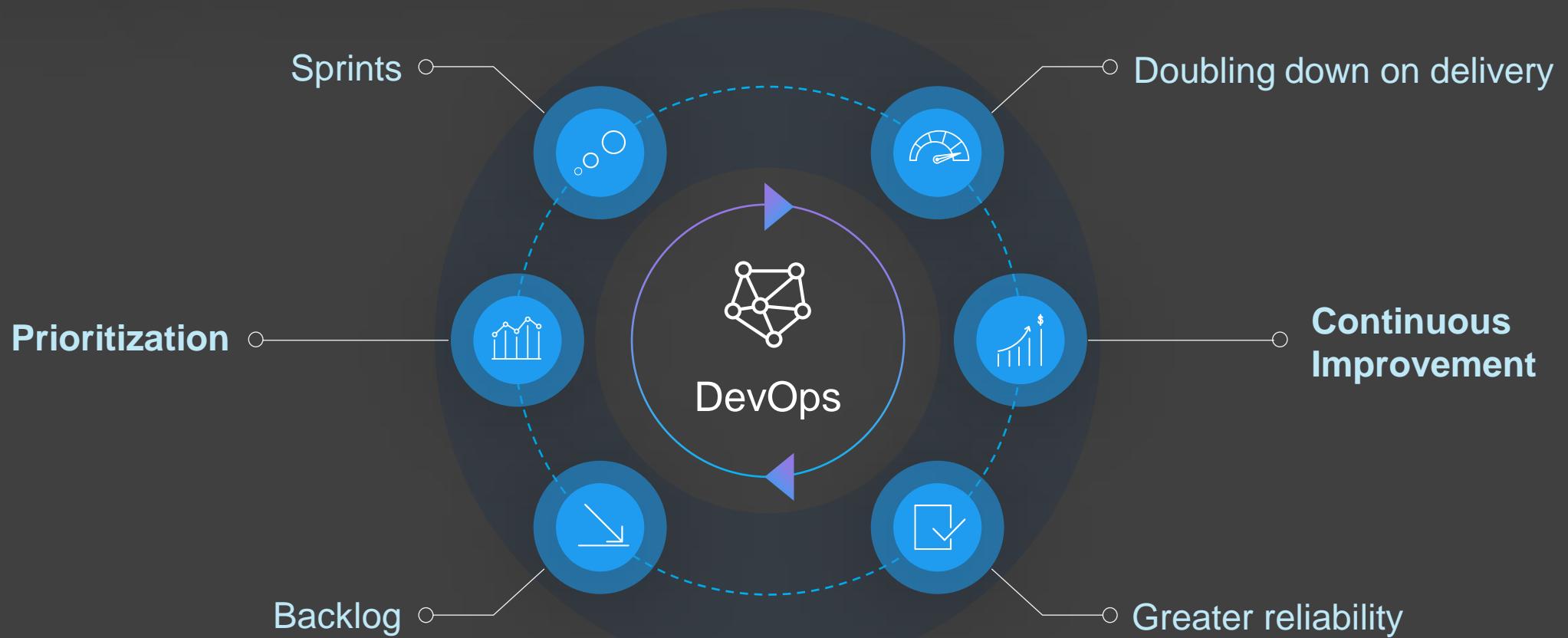


WALL OF CONFUSION

Process



DevOps is about delivering value...



Source Control

Introduction to Git and GitHub

What is Source Control and Why do we Need it?



A form of version control



Uses concept of code repositories



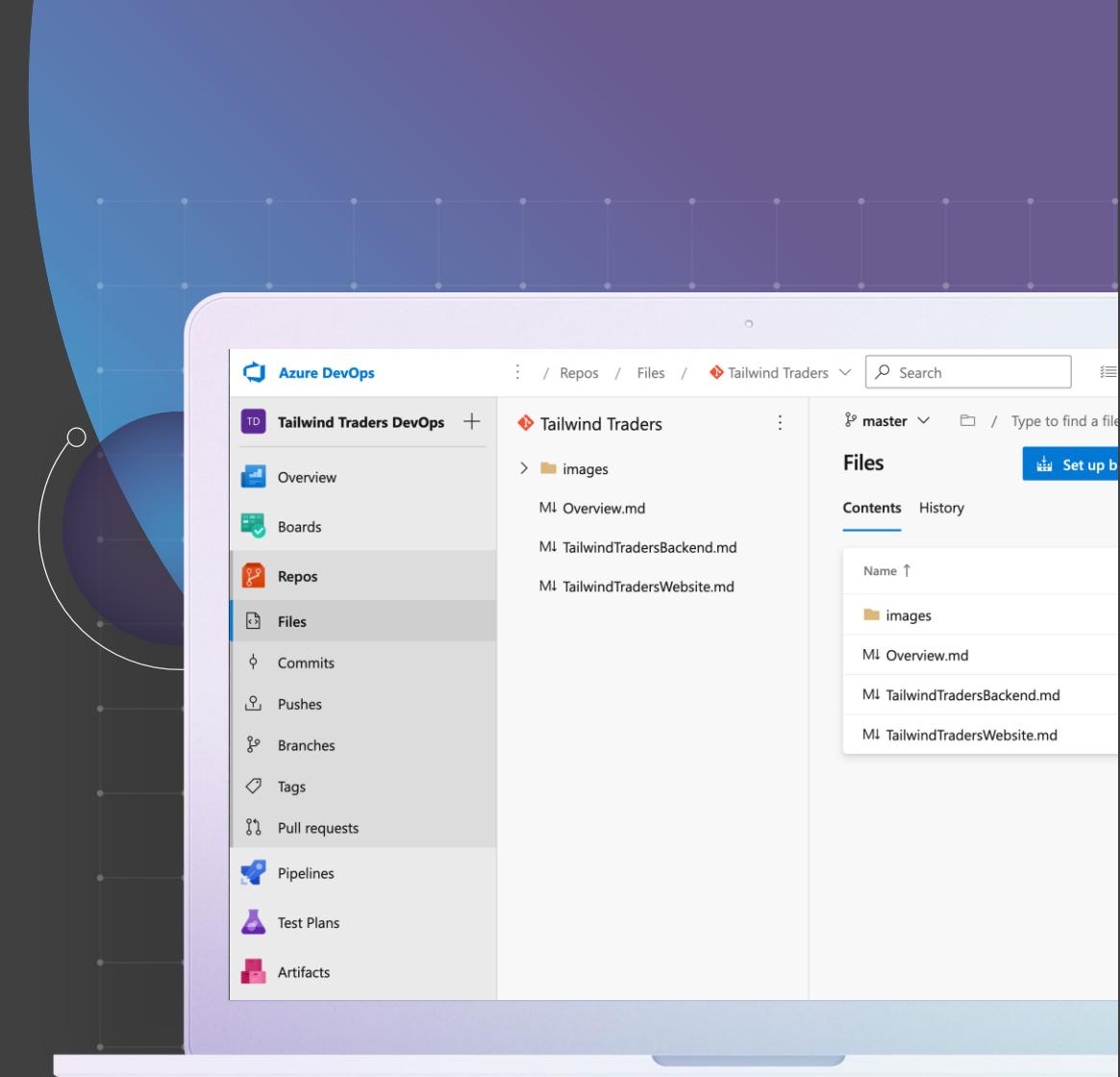
Tracks changes made within repositories



Allows for cross-team collaboration



GitHub



Components of a Git Project



Code!



Branches –
isolate
development
work



.gitignore –
untracked
files to ignore



Tags – point
to a specific
release



Commits –
track changes
to artifacts

What is GitHub?

GitHub is the leader in Git repository hosting. Some key features of GitHub

- Expertise sharing
- Cross-team collaboration
- Improved code reuse
- Codespaces on GitHub
- GitHub Actions (CI/CD)
- Increased velocity



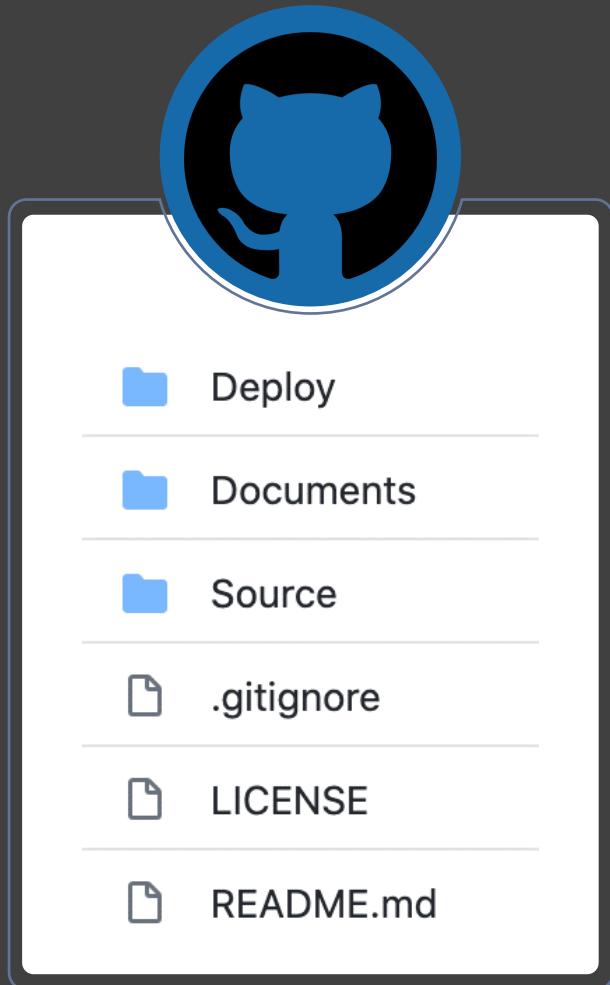
A screenshot of a GitHub repository page for 'jaydestro/TailwindTraders-Website'. The page shows a list of commits from 'jaydestro' over the past 5 days. The commits include updates to '.github/workflows', 'TailwindTraders.Website', and 'TailwindTradersBotComposer'. The interface includes tabs for Code, Issues, Pull requests, Actions, Projects, Wiki, Security, Insights, and Settings. The sidebar on the right shows repository statistics like 24 branches and 2 tags, and a language distribution chart.



[Learn about GitHub](#)

Features of a GitHub Project

- README.md file – Document your project
- SECURITY.md file – Define your security policy
- LICENSE file – Define the license for your project
- CODEOWNERS file – Define who is responsible for code
- Pull Requests – Request to merge your changes
- Issues – Track issues/bugs/features
- Releases – Bundle specific iterations of your project





Demo



GitHub In Action

Using Microsoft Teams as a Collaboration Hub



What is Microsoft Teams?

Microsoft Teams is the hub for teamwork.



Key features of Teams

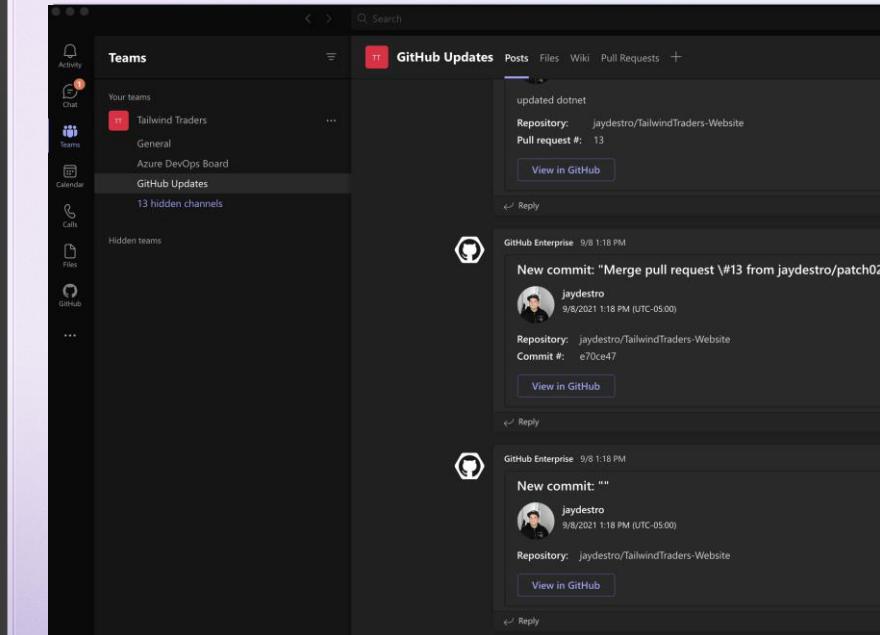
Chat from anywhere

Meet from anywhere

Call from anywhere

Collaborate from anywhere

Achieve more, faster

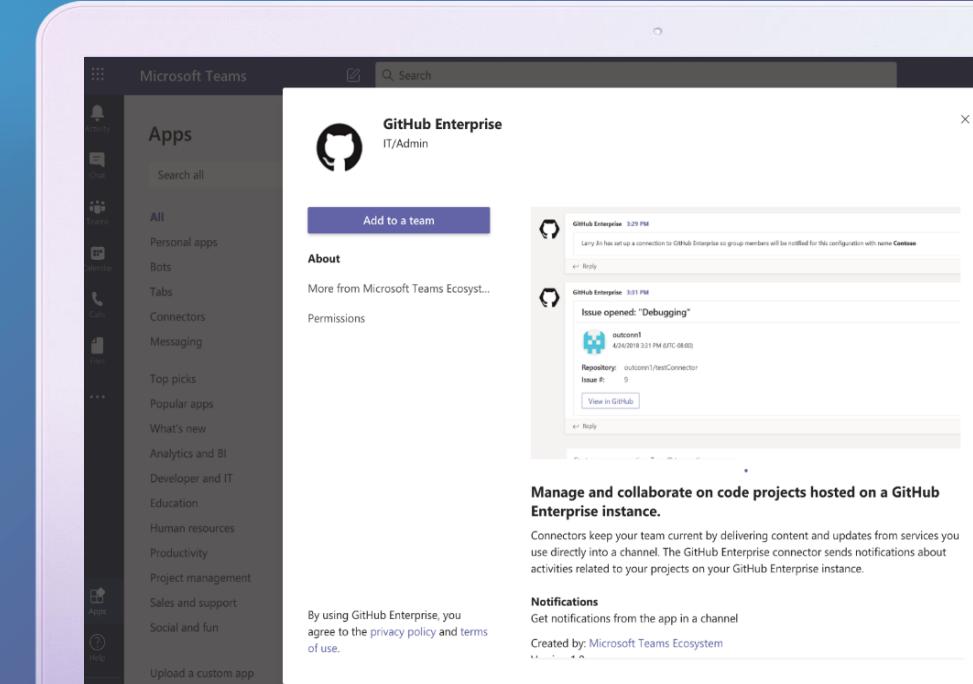


[Learn about Microsoft Teams](#)

Microsoft Teams Integration via GitHub Enterprise App

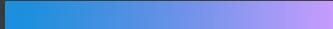


Uses a connector to send notifications directly into a specific Microsoft Teams channel.





Demo



Collaboration with
Teams

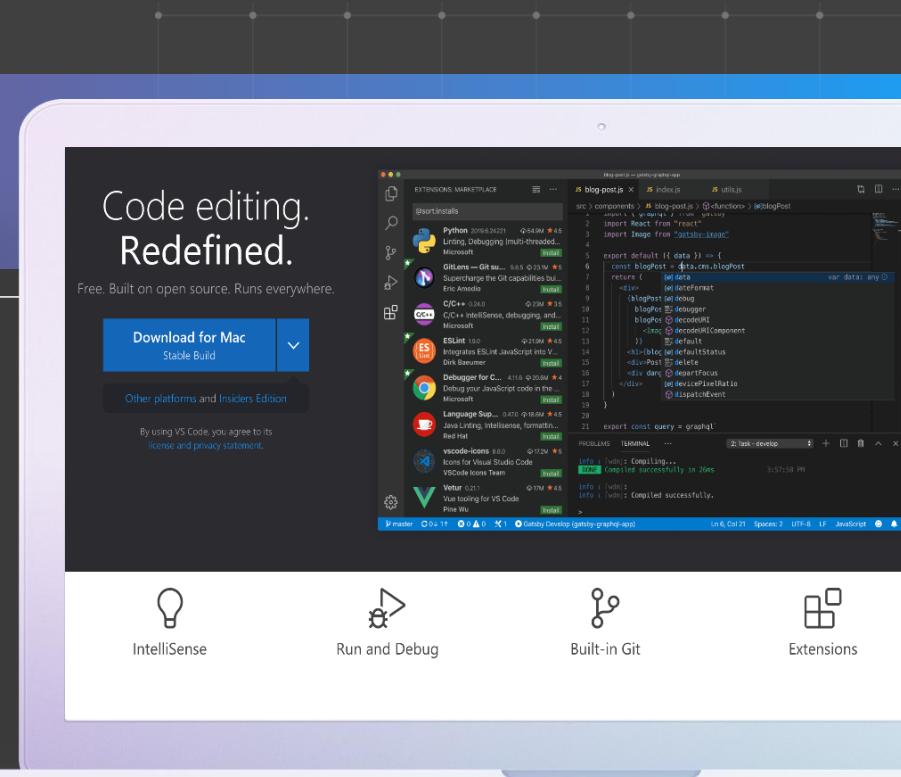


Extending DevOps with Visual Studio Code

What is Visual Studio Code?

Visual Studio Code is a lightweight and powerful source code editor.

- Run anywhere (Mac, Win, Lin)
- Git commands built-in
- Extensible and customizable
- IntelliSense syntax highlights
- Easily debug code
- Open Source
- Free!



[Learn about Visual Studio Code](#)

The screenshot shows the Visual Studio Code interface with the GitHub Actions workflow configuration file 'main.yml' open in the editor. The file is located in the '.github/workflows' directory of the 'TAILWINDTRADERS-WEBSITE' repository. The code defines a workflow named 'deploytobbenztailwindstaging' triggered by pushes to the 'master' branch. It uses the 'ubuntu-18.04' runner and the 'actions/checkout@v2' action. The workflow includes steps for setting up .NET Core (version 2.1.x) and Node.js (version 10.x), and for running 'dotnet restore' on the project's solution file.

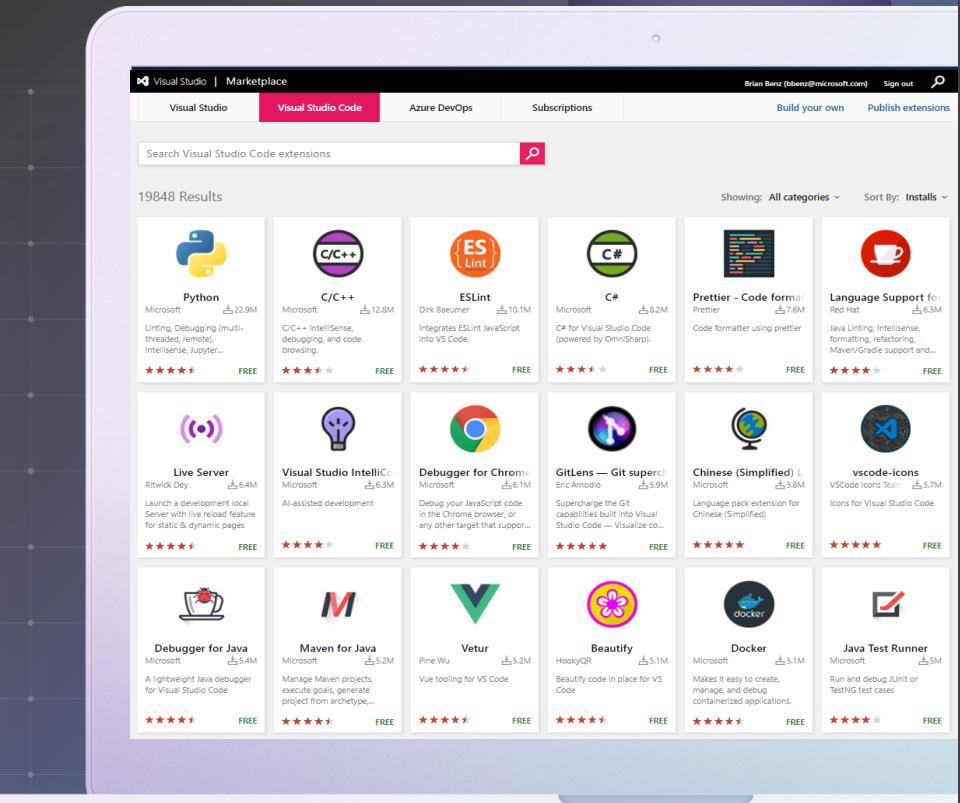
```
! main.yml <br/>github > workflows > ! main.yml > {} jobs > {} build > runs-on<br/> 1 | name: deploytobbenztailwindstaging<br/> 2 |<br/> 3 | on:<br/> 4 | push:<br/> 5 | branches: [ master ]<br/> 6 |<br/> 7 | env:<br/> 8 | AZURE_WEBAPP_NAME: bbenztailwindstaging<br/> 9 |<br/>10 jobs:<br/>11 build:<br/>12<br/>13 runs-on: ubuntu-18.04<br/>14 env:<br/>15 CI: ""<br/>16 baseRunUrl: "https://github.com/bbenz/TailwindTraders-Website/actions/runs/"<br/>17<br/>18 steps:<br/>19 - uses: actions/checkout@v2<br/>20<br/>21 - name: Setup .NET Core<br/>22 uses: actions/setup-dotnet@v1<br/>23 with:<br/>24 dotnet-version: 2.1.x<br/>25<br/>26 - name: Setup Node 10<br/>27 uses: actions/setup-node@v1<br/>28 with:<br/>29 node-version: 10.x<br/>30<br/>31 - name: Install dependencies<br/>32 run: dotnet restore ./Source/*.sln
```

Visual Studio Code Marketplace

Thousands of extensions!

Microsoft and Third-party

- Language support
- Tooling support
- Connectivity
- Deployment
- Multi-cloud

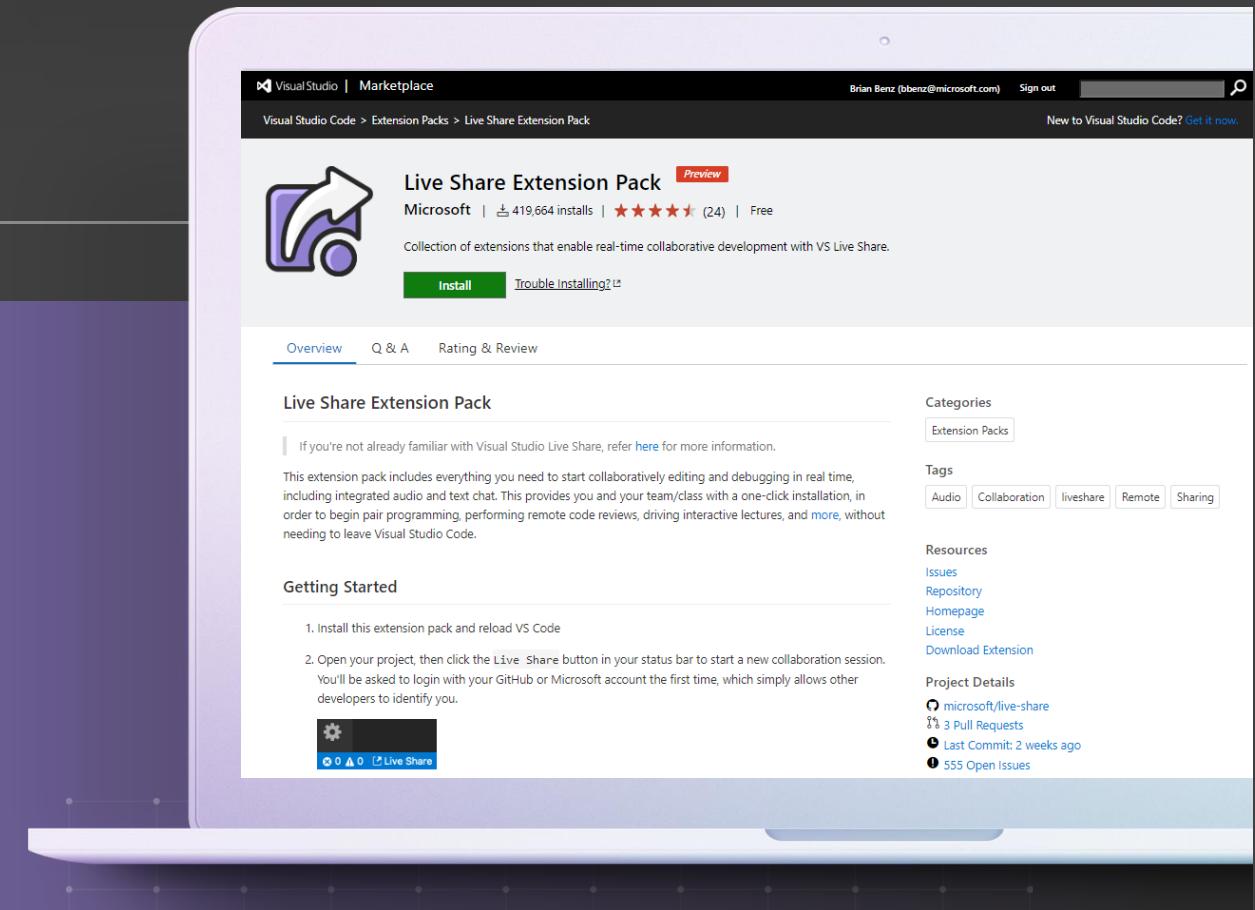


[Learn about Visual Studio Code Marketplace](#)

Extension Example – Live Share Extension Pack

Share your code and collaborate

- Share terminals and servers
- Edit
- Debug
- Audio calls
- Chat



Demo

Tying it all together
with Visual Studio
Code



Recap

DevOps and
Tailwind Traders

Tailwind Traders



Needed Solving

- Rapidly growing
- Lack of collaboration
- Lack of shared tooling



The Solution

- Source control via GitHub
- Microsoft Teams collaboration hub
- Visual Studio Code for shared tooling
- Solid foundation for a DevOps strategy

Session Resources

Explore Microsoft Learn Content
for the AZ-400 Certification



[Learn about getting started on DevOps](#)

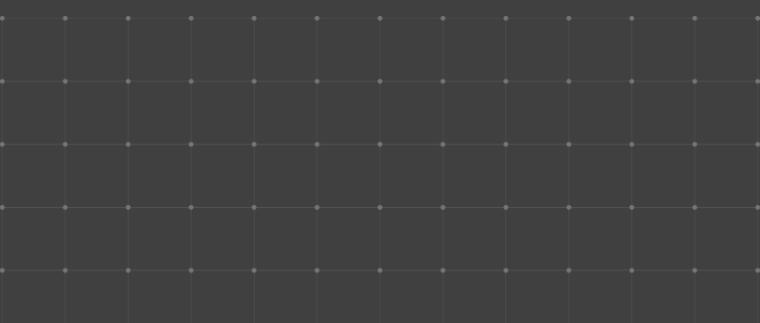


Get Certified

Designing and Implementing
Microsoft DevOps Solutions



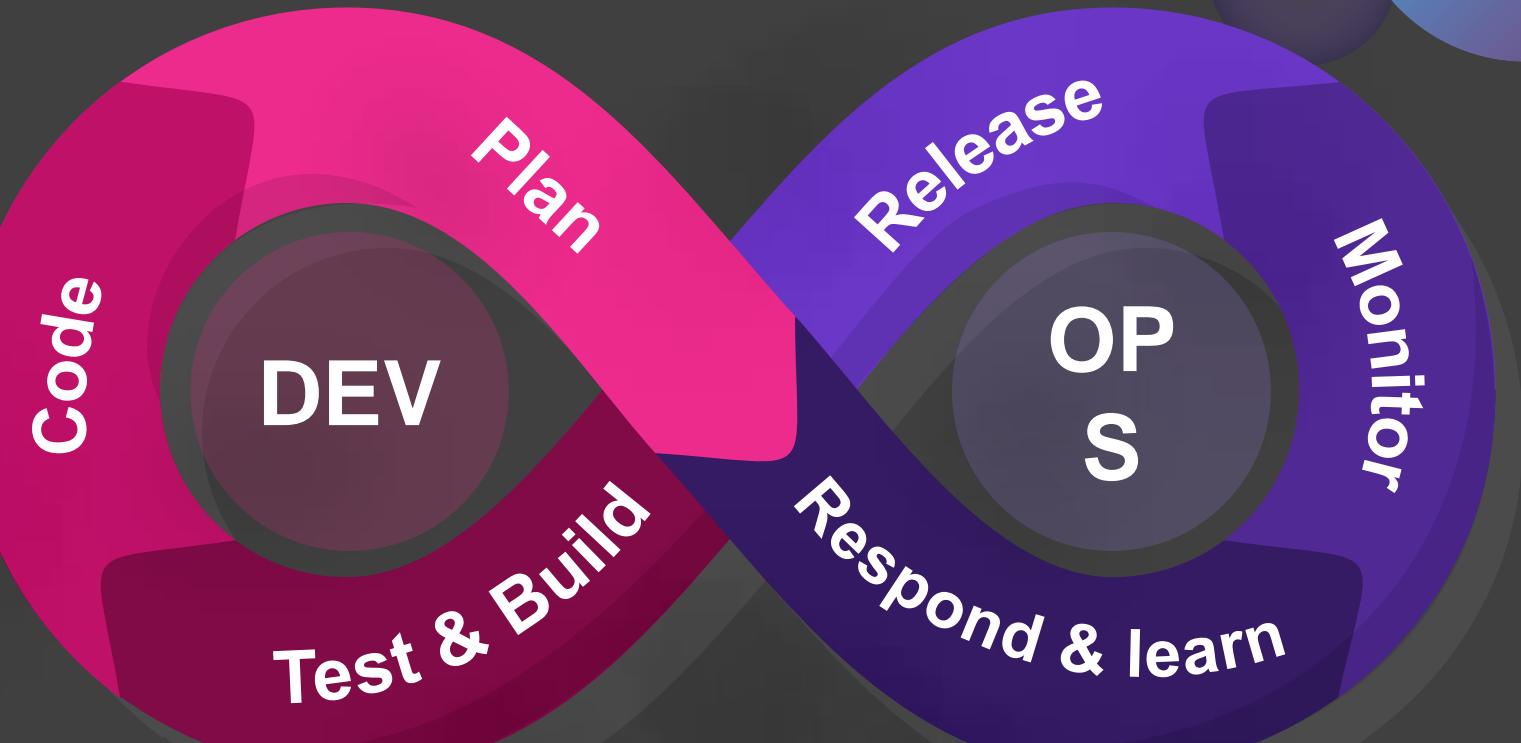
[Learn on AZ-400 Certification](#)





DevOps in Azure: Managing the flow of work

Tailwind Traders all in on DevOps



“

*DevOps is the union of People, Process,
and Products to enable continuous
delivery of value to our end users.*

— Donovan Brown



Why is DevOps so Important?



Your competition is already doing this



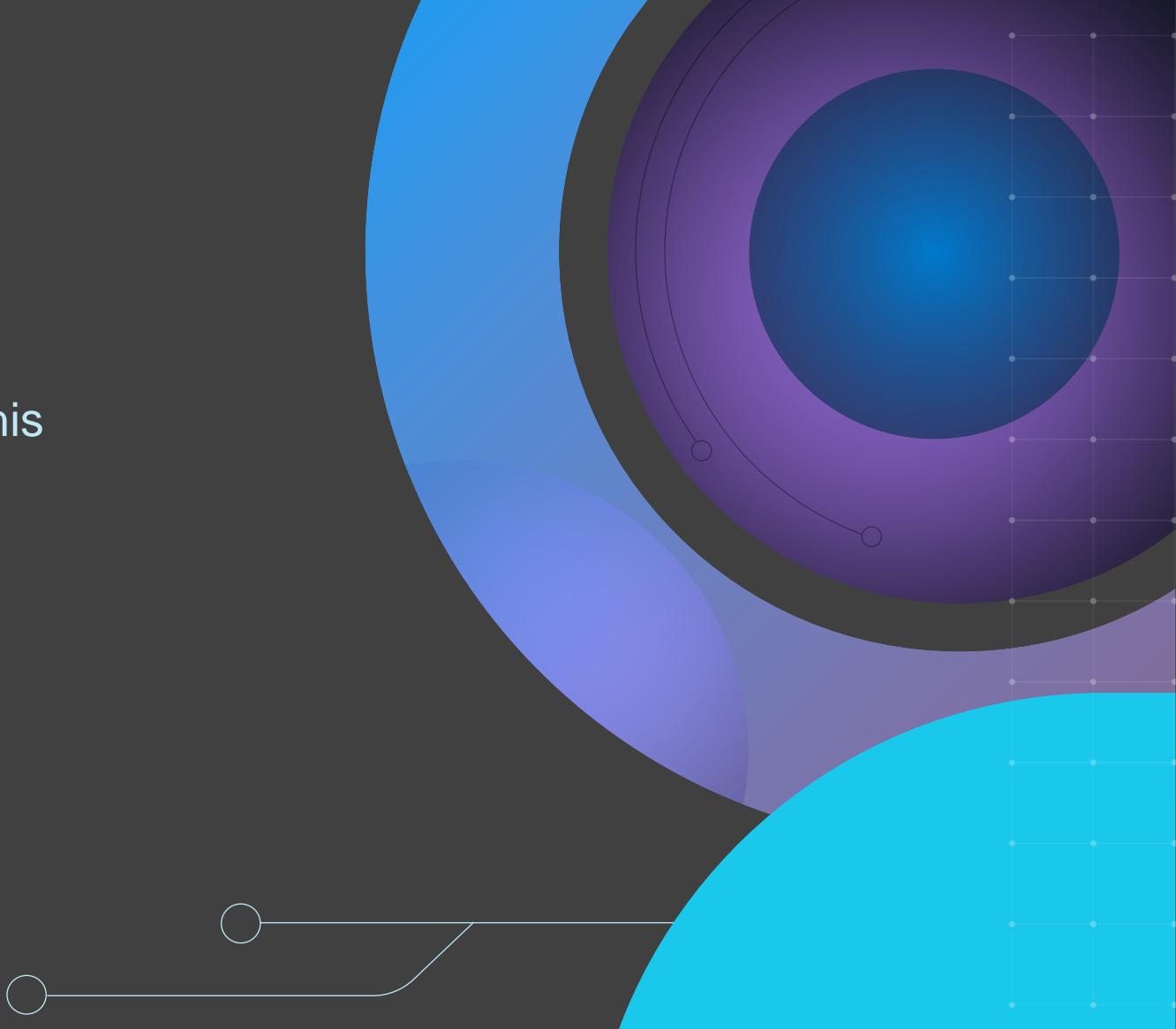
Increase velocity



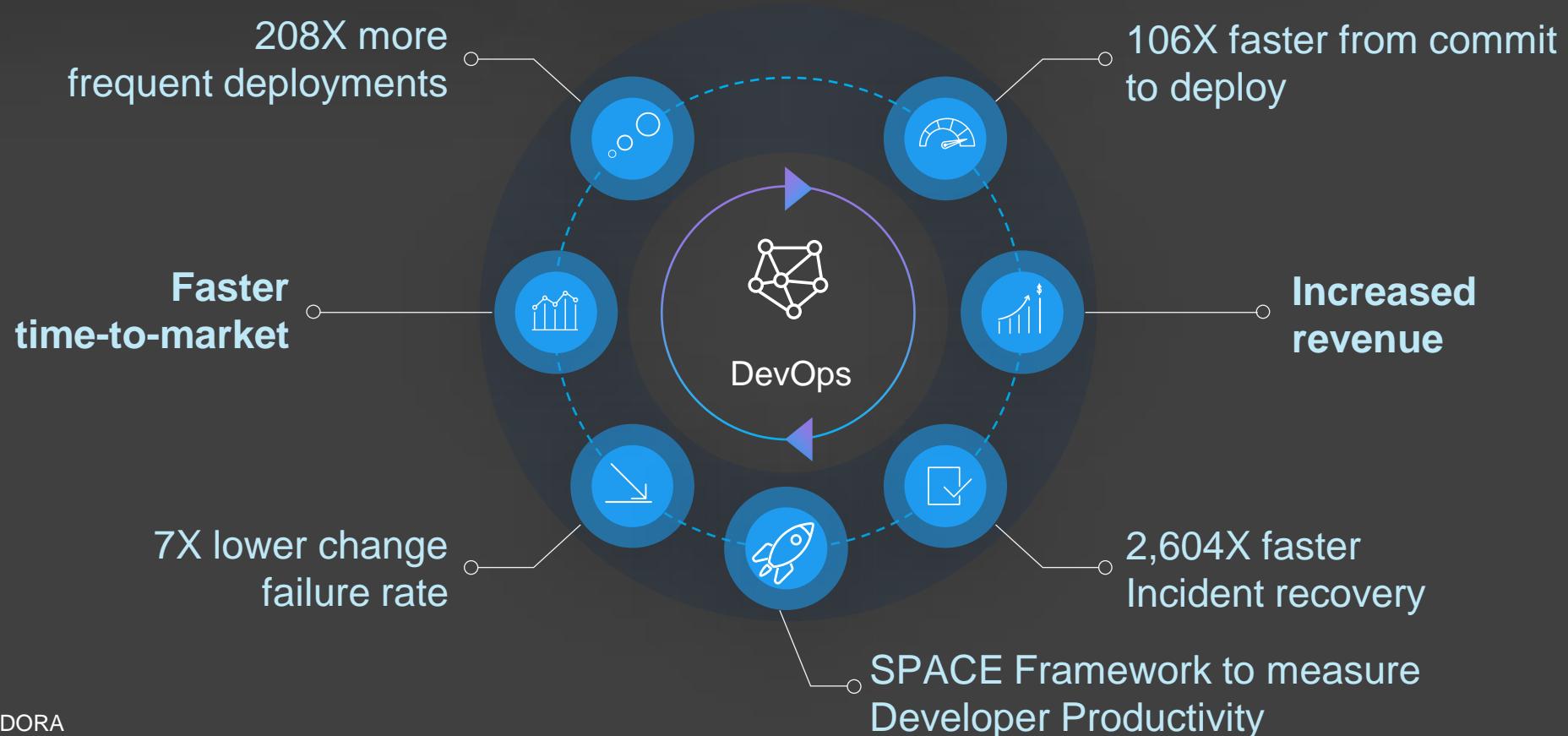
Reduced downtime



Reduced human error



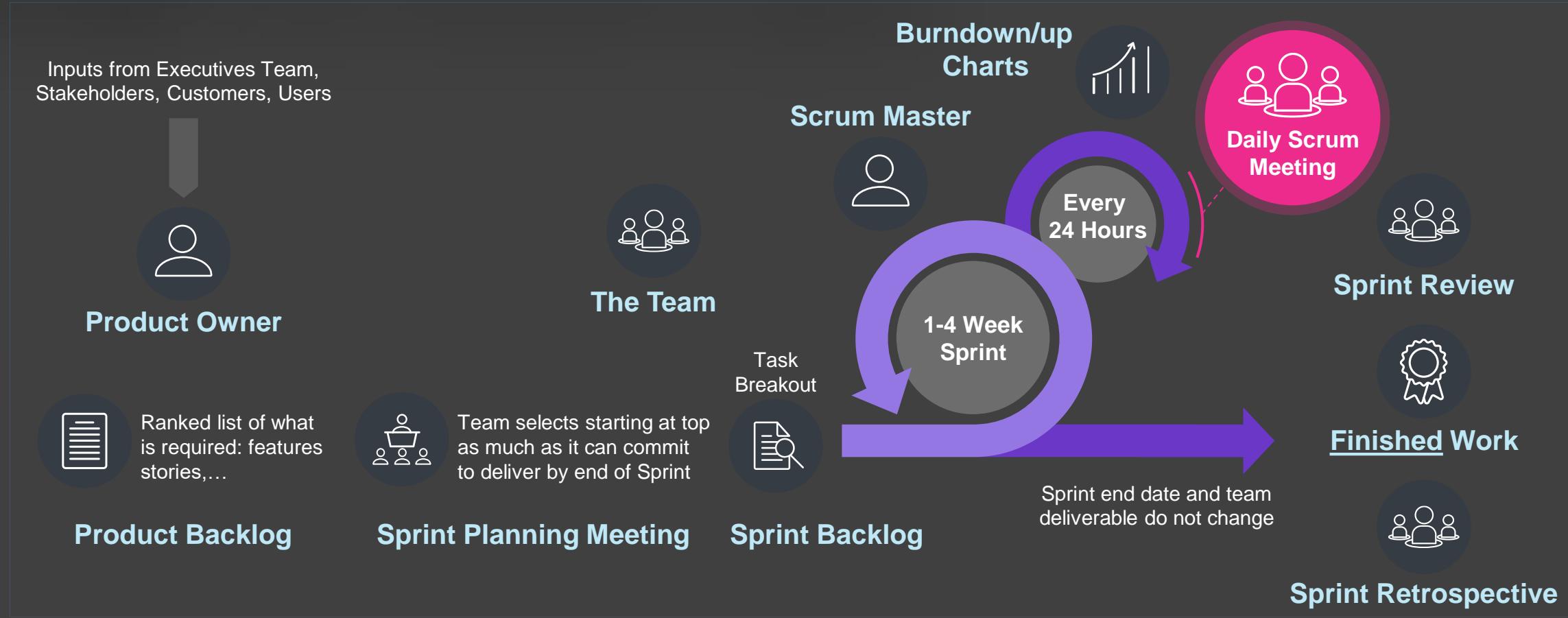
High performance DevOps Companies Achieve Developer Velocity by...

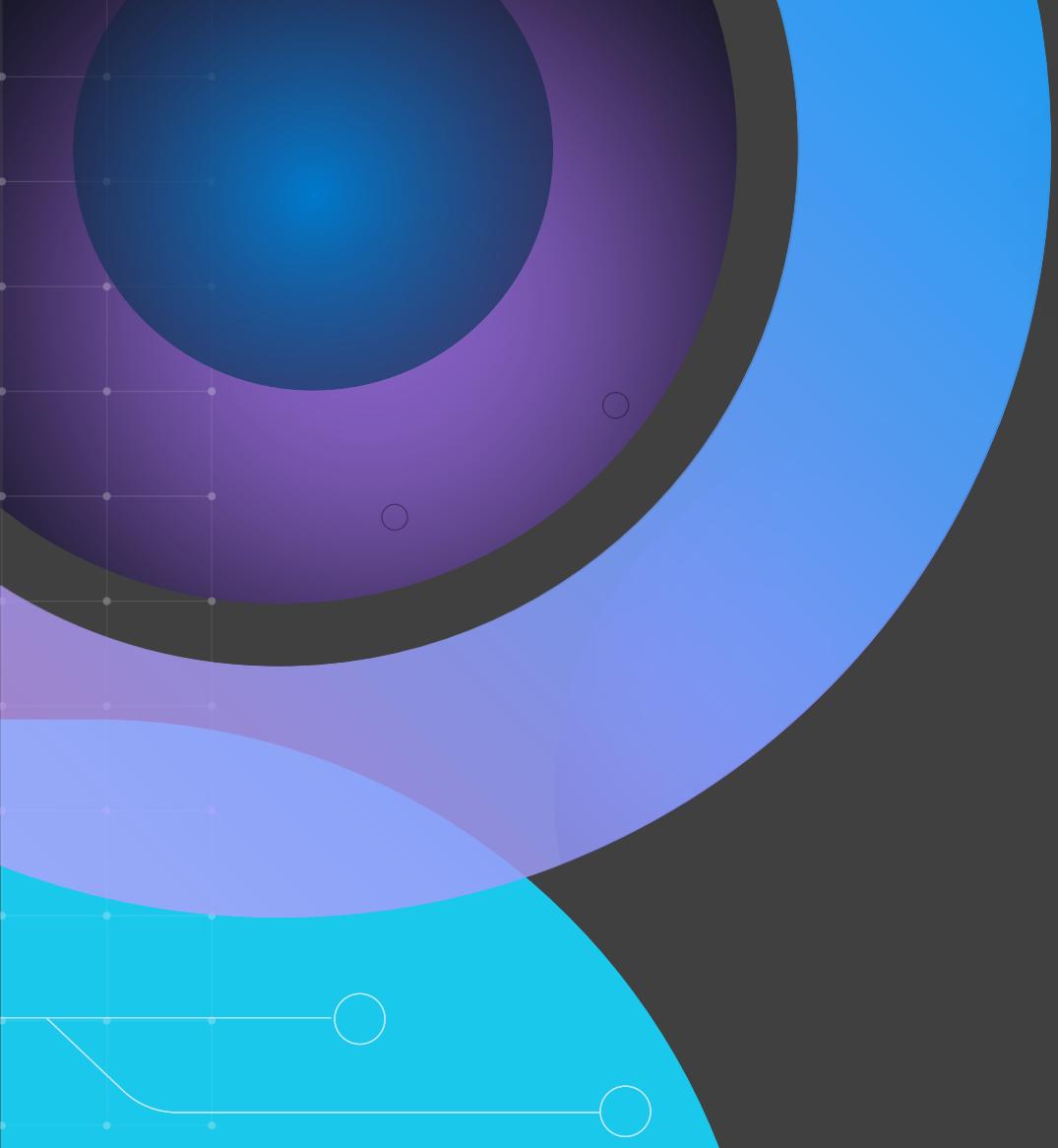


Source: 2019 DORA

Scrum

The Agile: Scrum Framework at a glance





General Principles



Product is built incrementally



Frequent inspection and adaption (course correction)



Transparency (Product and Sprint backlogs are public)

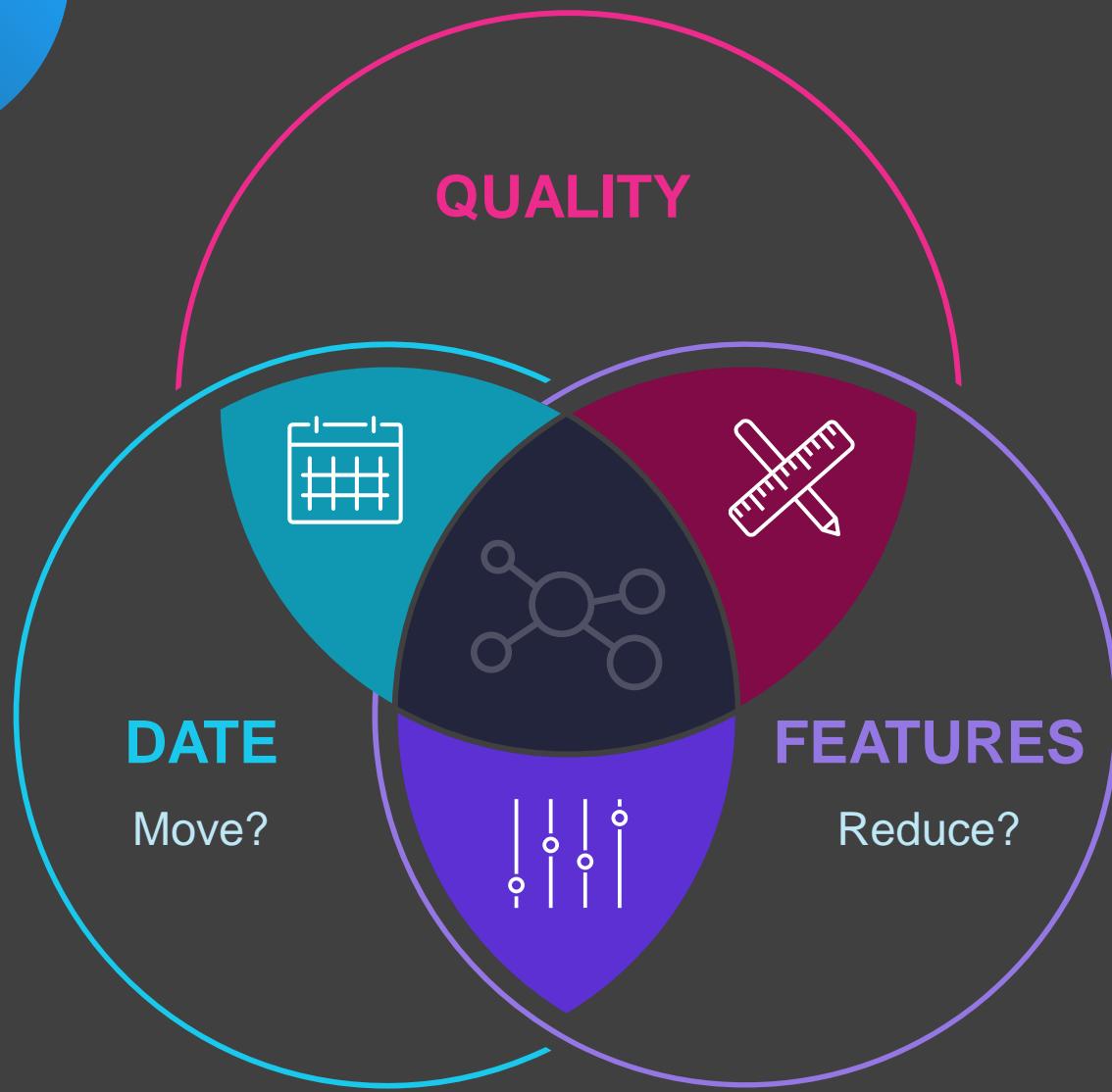


Product Owner, Development Team, Scrum Master



Scrum Teams are self-organizing and cross-functional

Quality is non-negotiable



Estimates

Never accept an estimate over 4 hours



More accurate



Enables parallel development



Confirms alignment with DoD



Never start from a date

The Rules Apply to Everyone

No one is
above the law



Even the CEO
must obey the
rules





Demo

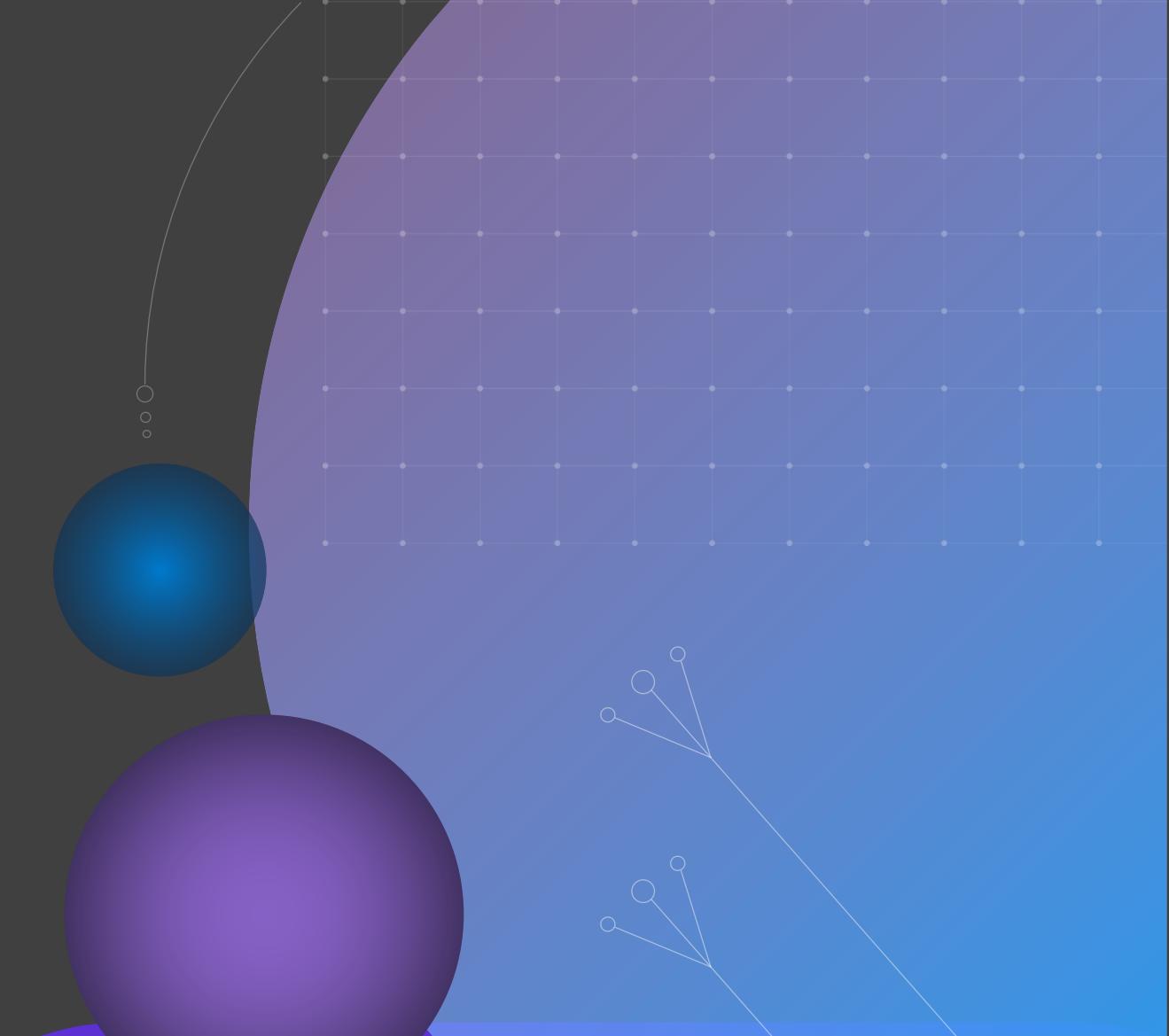


Tracking Work using Azure Boards



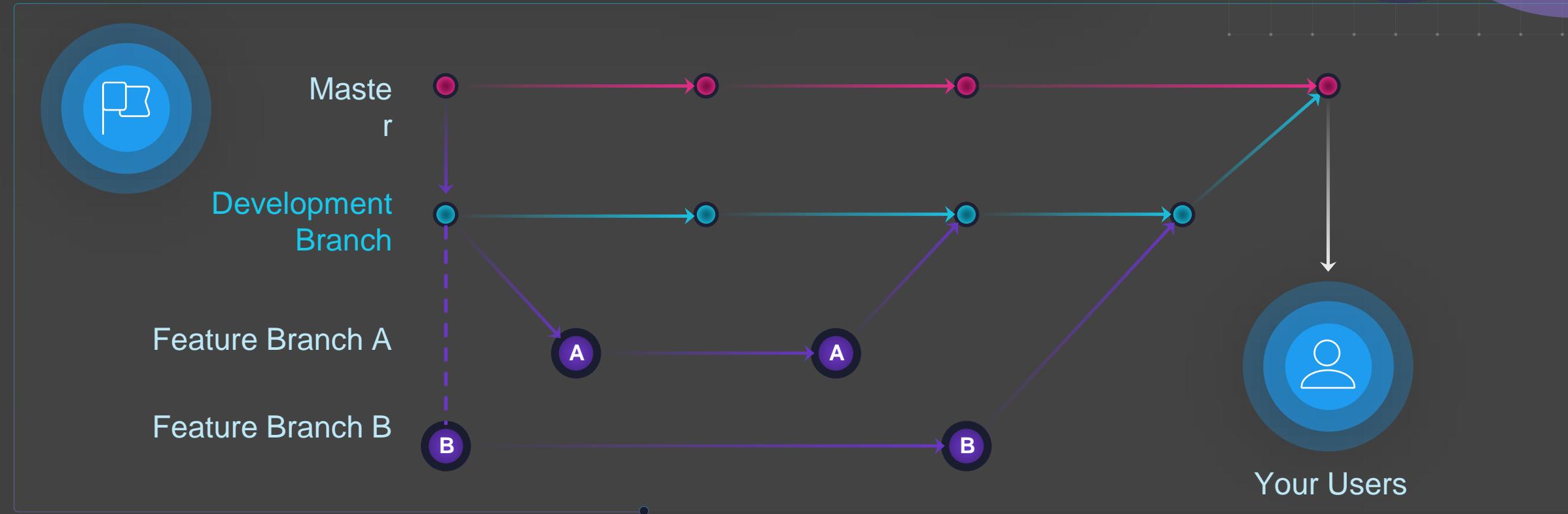
Branching Strategy

**Choosing the right
branching scheme is
critical to success**



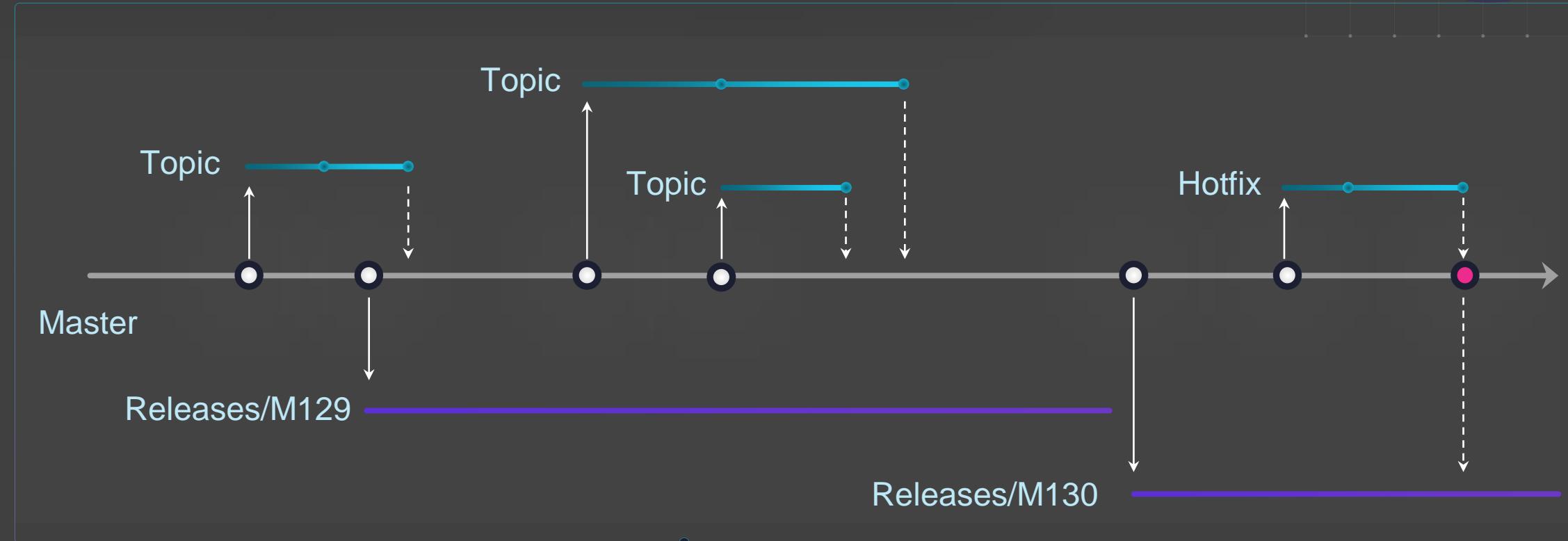
Traditional Branching Strategy

Feature Branching without flags



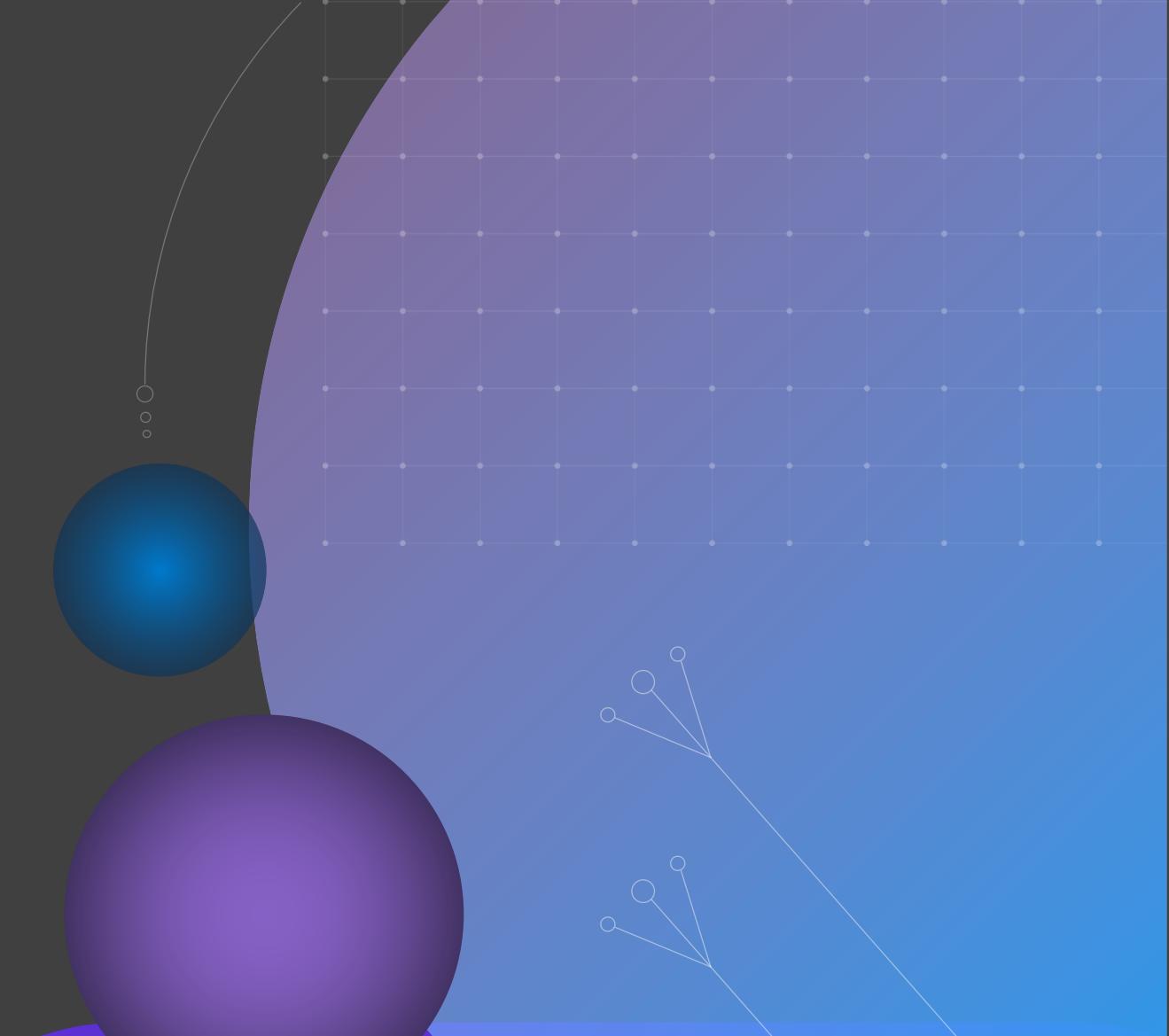
Trunk Based Development

Using trunk based development to avoid merge debt





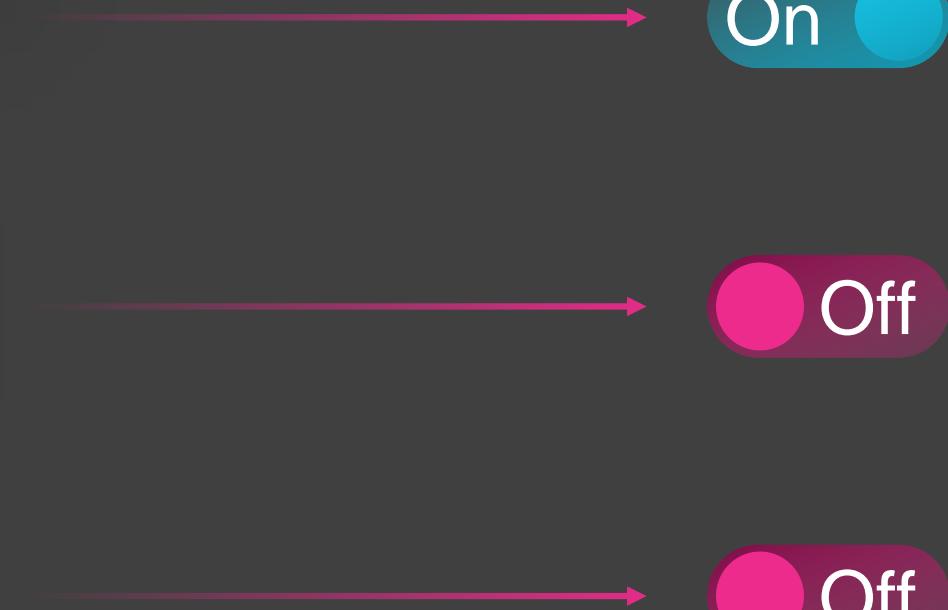
How can that
work???



Feature Flags



New Feature



Feature Flag or Toggle

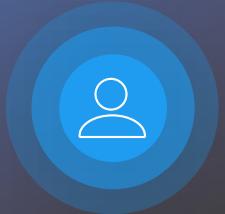


Consumers

Glorified If statement

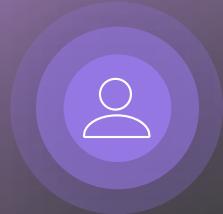
Bob

```
{  
Key: bob@example.com",  
name: "Bob Smith",  
group: "beta"  
}
```



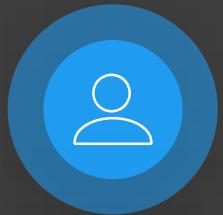
Sarah

```
{  
Key: sarah@example.com",  
name: "Sarah Jones",  
group: "normal"  
}
```

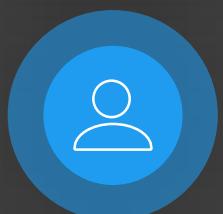


“Beta Page”

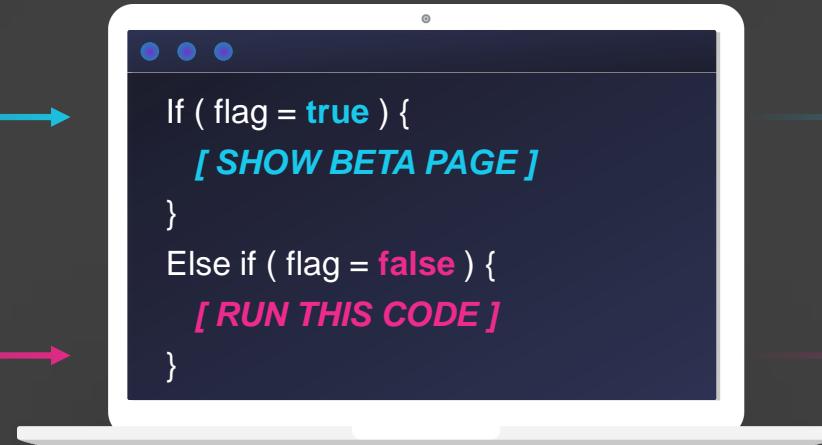
If group is **beta** return **true**
... if not, return **false**



true



false

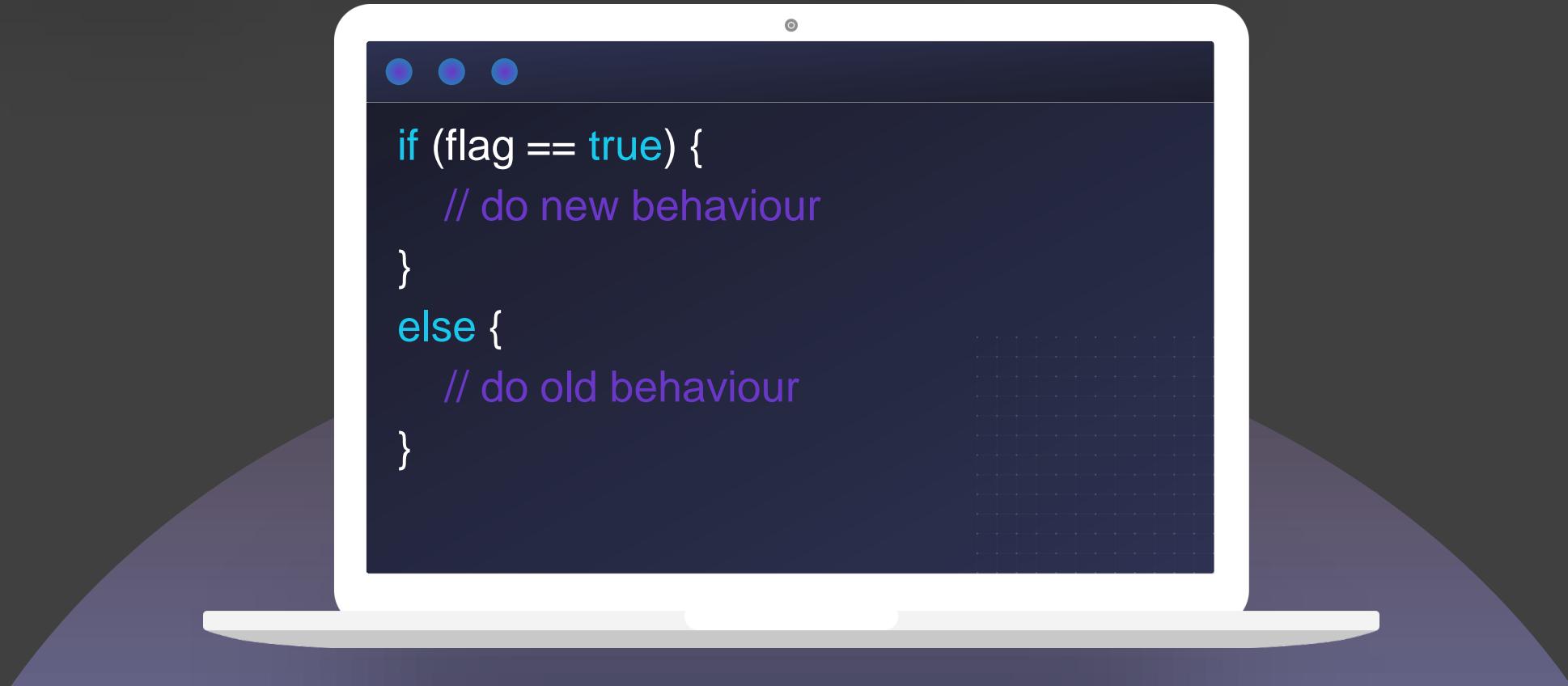


Your Code



Result

No really... it's an if statement



A/B Experiments



50% visitors see
variation A



Variation A



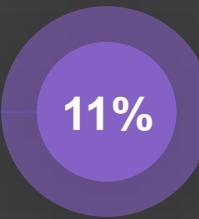
Conversion



50% visitors see
variation B



Variation B



Conversion

Safe Deployment



New Feature



Soft Launch



Incremental Rollout

Rollback

Set switch to off. Done



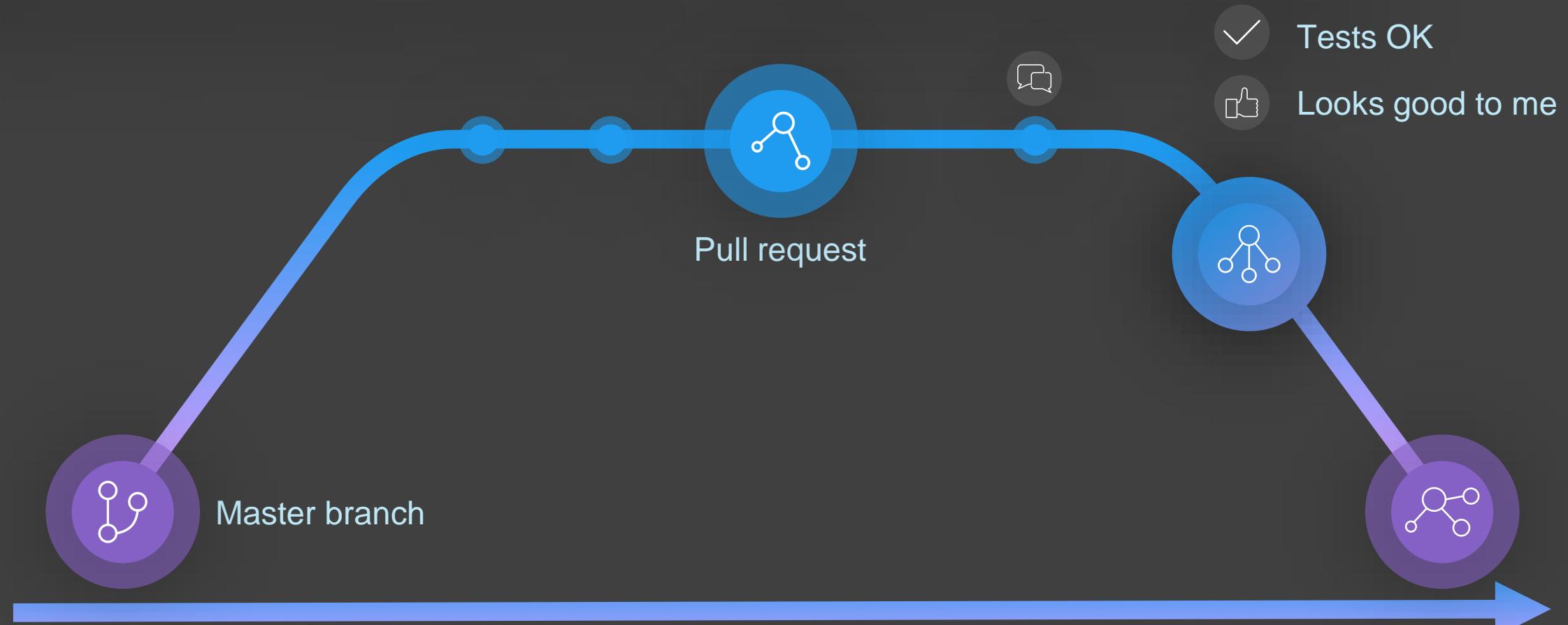
Done



Demo

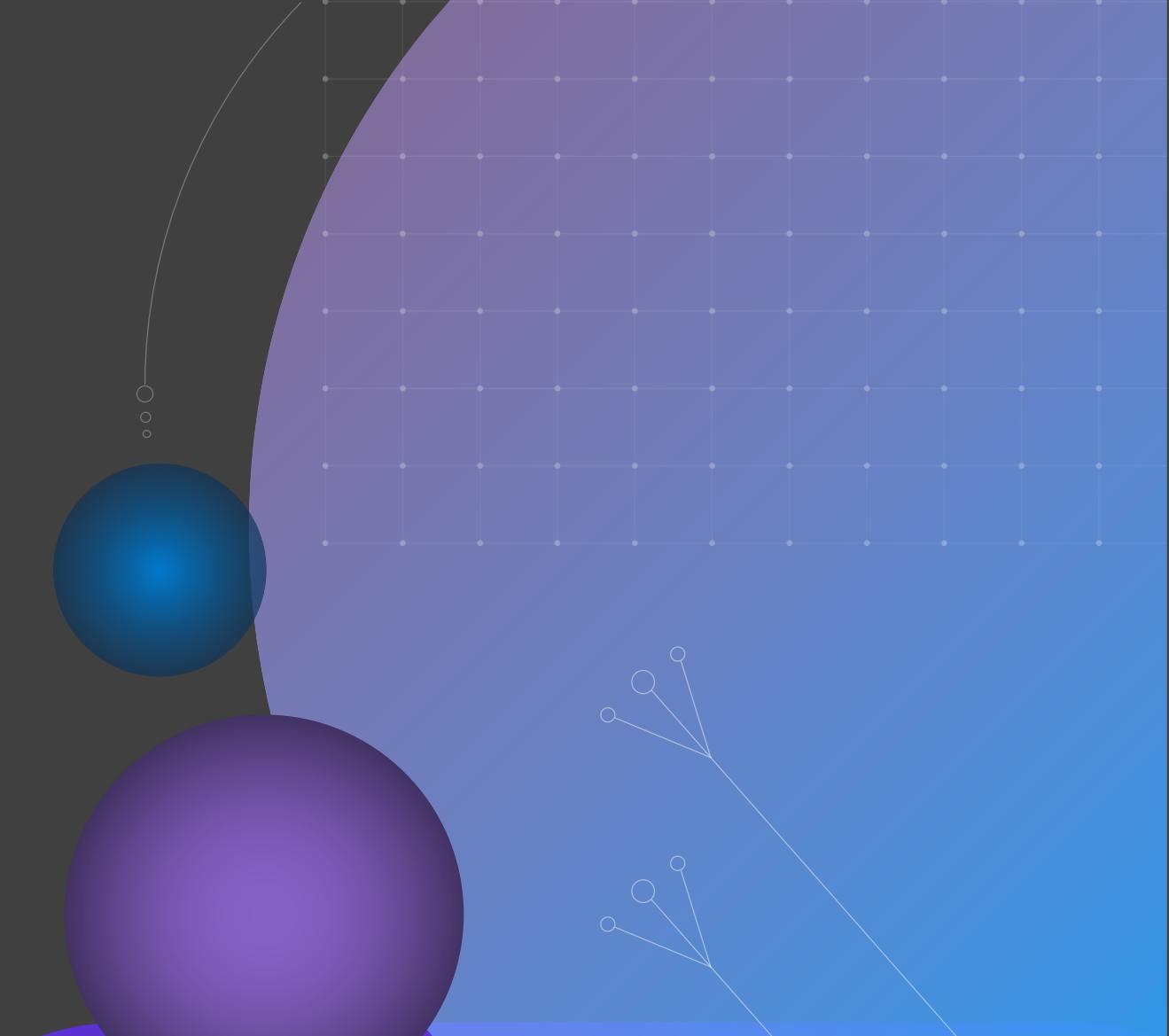
Feature Flags

Maintaining Quality w/Pull Requests





Automation
to the
rescue!



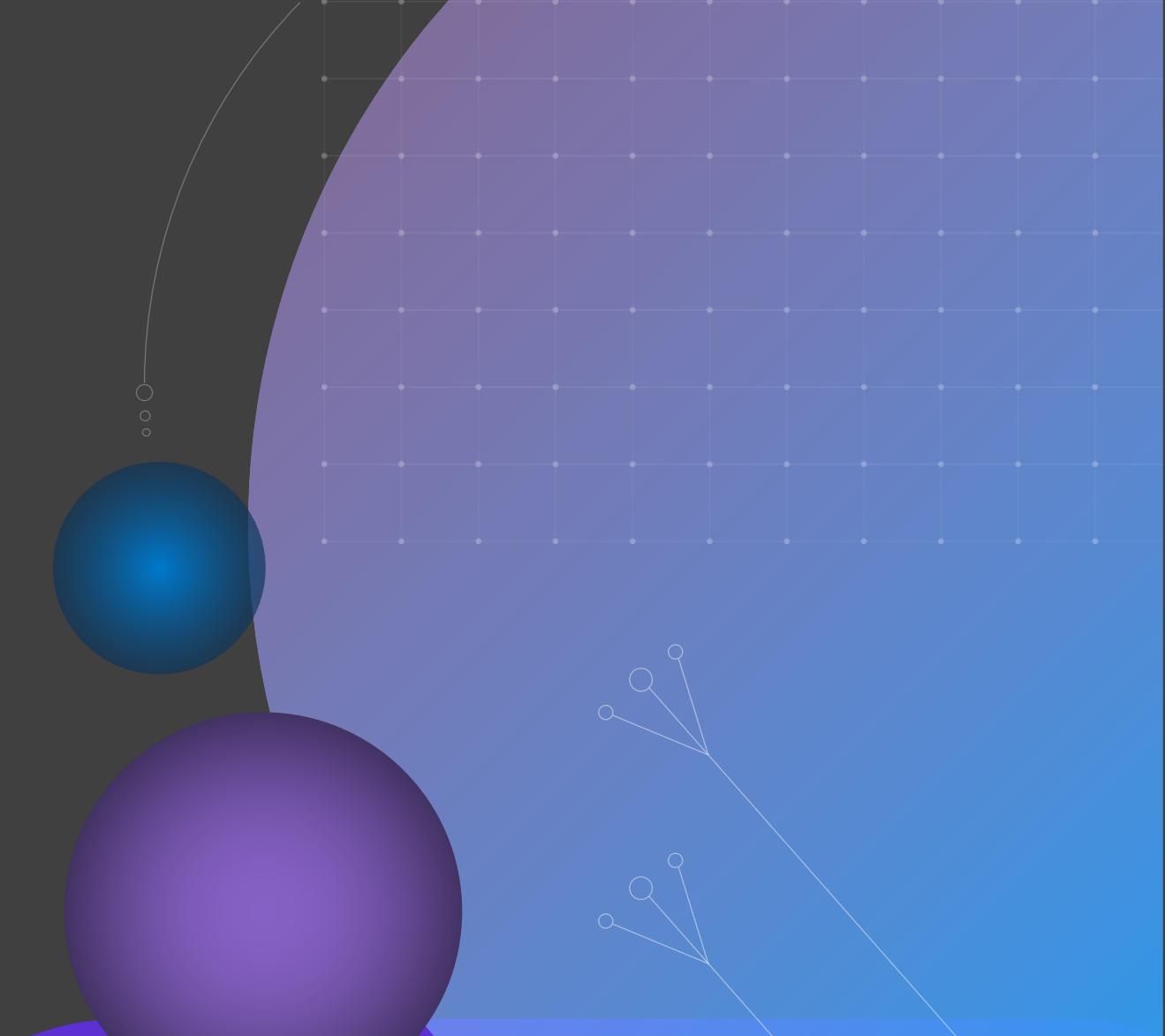
Demo



Automation with GitHub Actions



**Tailwind
Traders
is now in a
good state**



Let's Recap



Tailwind Traders



Needed Solving

- Managing Work
- Managing Source Control Changes
- Automation to help with processes



The Solution

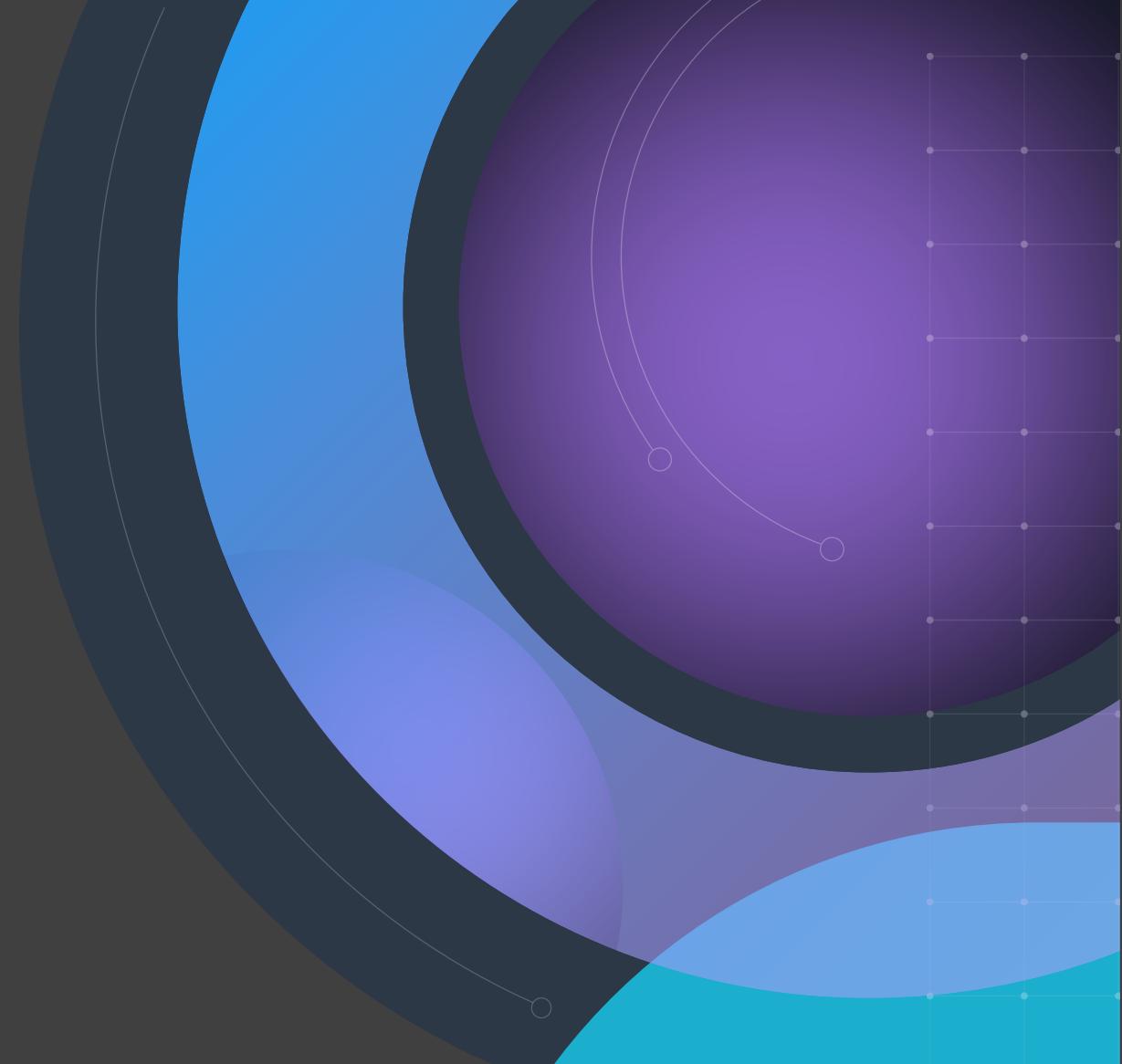
- Scrum and Azure Boards
- Trunk Based Development
- Feature Flags
- GitHub Actions





Delivering Change to the Cloud

DevOps Learning Path



-  Getting Started with DevOps
-  Managing the Flow of Work
-  Delivering Change to the Cloud
-  Building in Security and Quality
-  Operating Software in the Cloud

Goals for this Session



Continuous Integration
Continuous Delivery /
Deployment

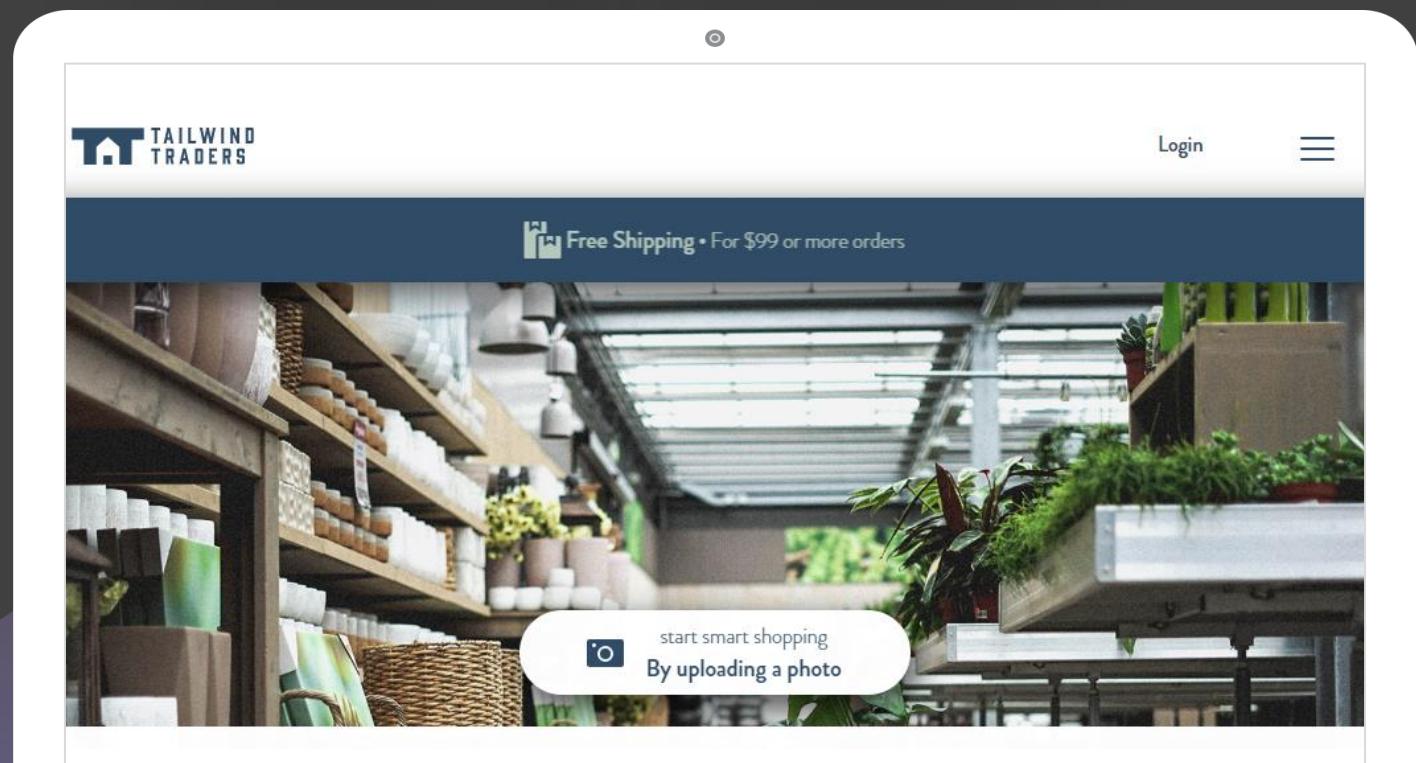


Trunk Based Development



Protect Production /
Secrets

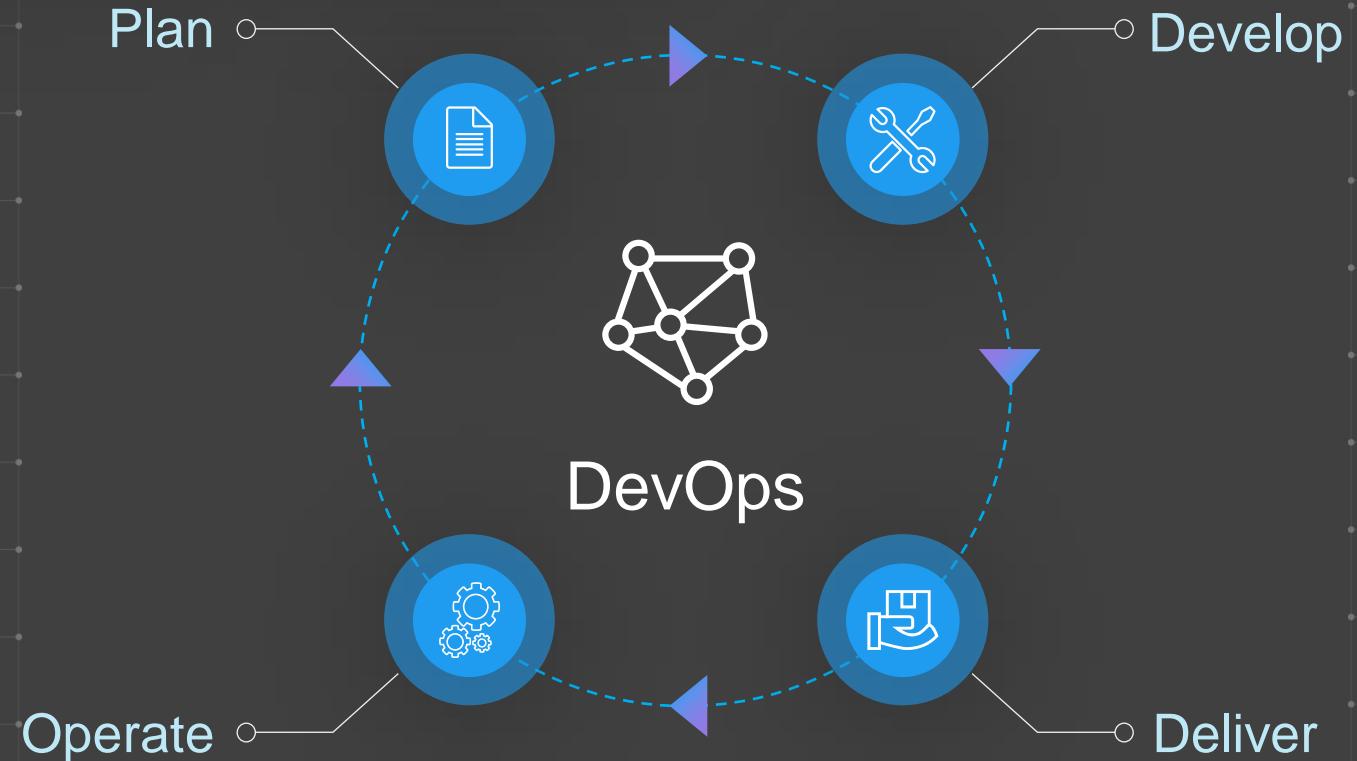
Tailwind Traders



DevOps Accelerates Delivery

“

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





CI and CD

Continuous Integration

Continuous Delivery

Continuous Deployment

Continuous Integration



Your changes work with everyone else's changes



Your code still builds



Your tests still run

Continuous Delivery



You have a deployable piece of work

Including infrastructure and dependencies

Deploy from build to a testing, staging, and/or production environment

Continuous Deployment



Trustworthy and reproducible



Doesn't have to be to Production



Deploy that piece of work

CI and CD



Continuous Integration –
Develop phase. Build, test, and validate code.



Continuous Delivery –
Automates delivery. New build artifact is available, artifact is deployed.



Continuous Deployment –
From when you commit and check in code to production, everything is automated

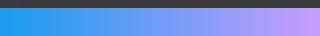
Protip

Always have
Continuous Deployment to
somewhere.

Don't assume this version will deploy
as cleanly as the last.



GitHub Actions



CI/CD with GitHub Actions

GitHub Actions



Automation for any software workflow



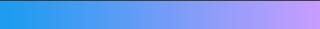
Dozens of events that can trigger workflows



Continuous Integration and Continuous Delivery



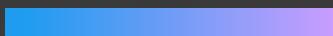
Demo



GitHub Actions – CI / CD

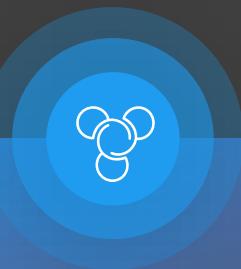


Protecting Production



We might not want every change to
go to Production

Pull Request Workflows



Workflow triggers
on PR

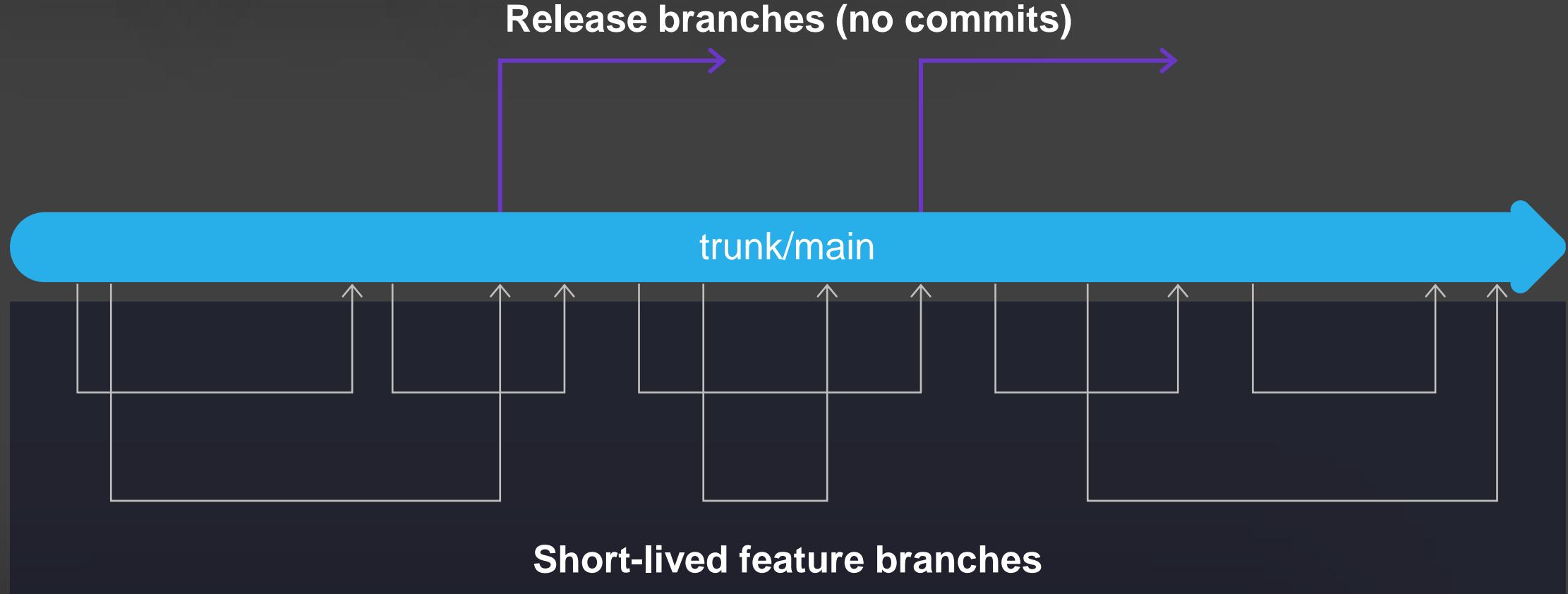


Build, test, deploy

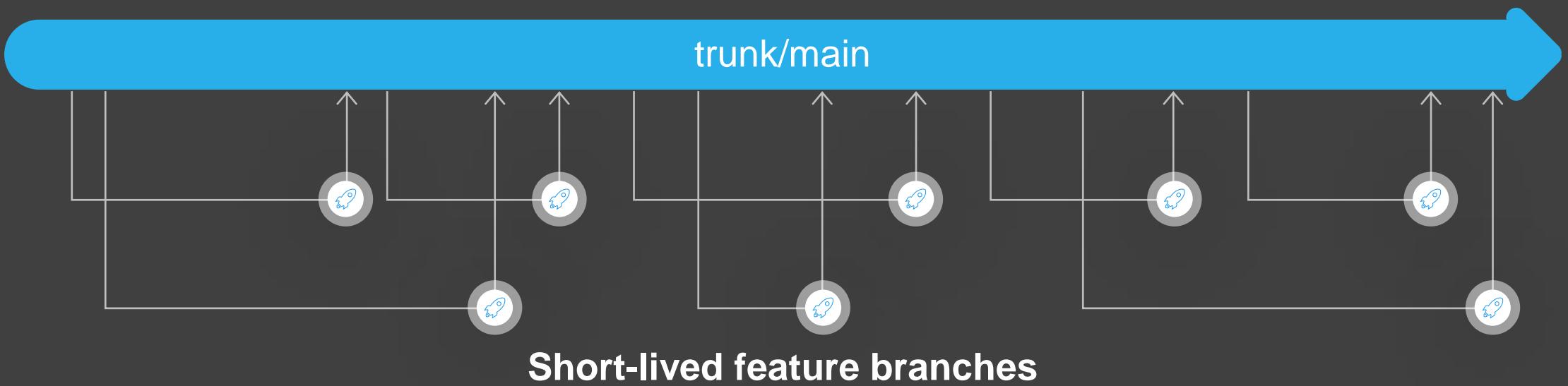


Checks before merging
to main branch

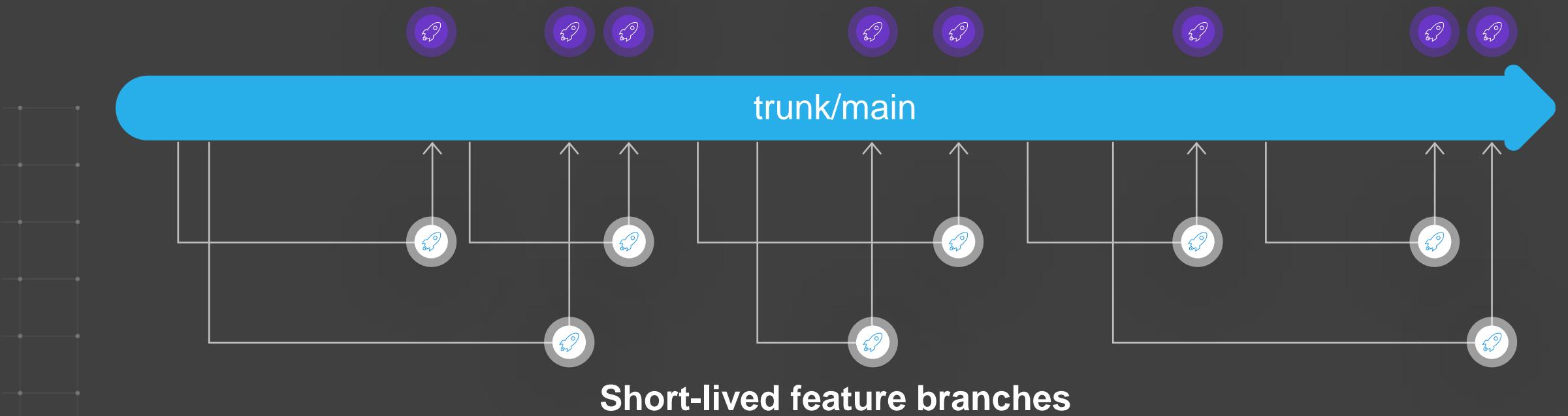
Trunk-based Development



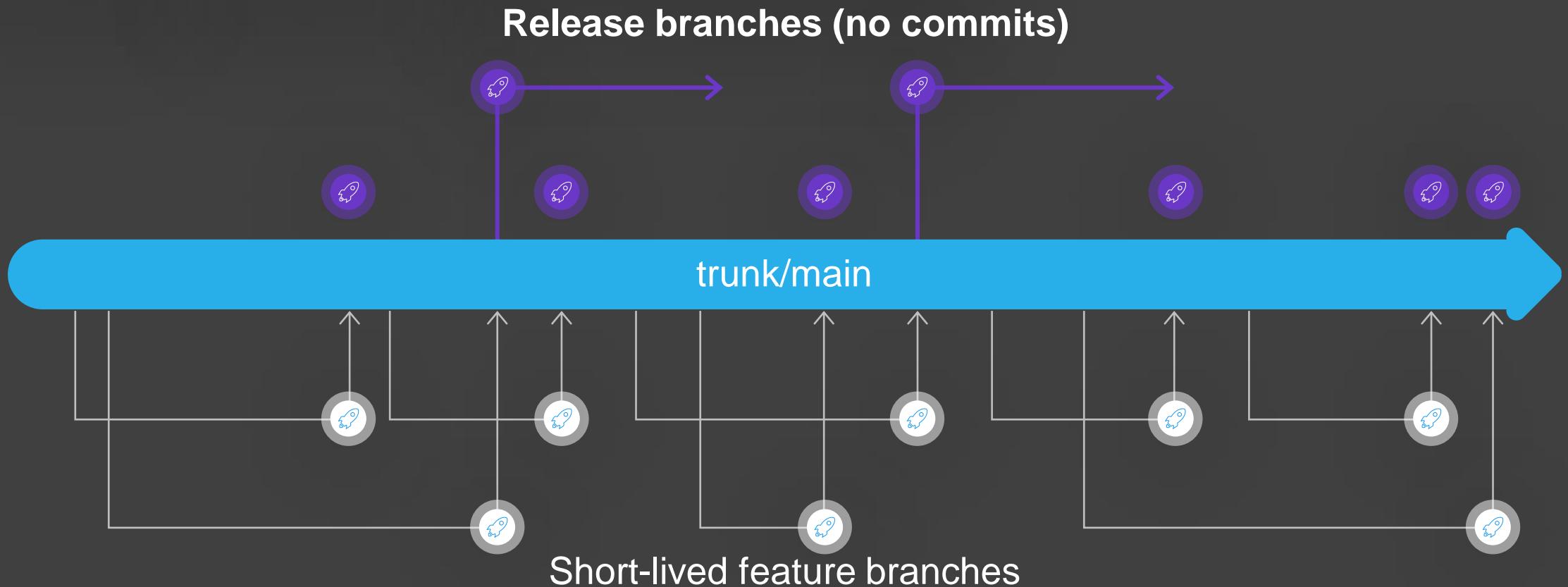
Trunk-based Development



Trunk-based Development



Trunk-based Development



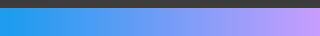
Demo



Trunk Based Development and PR
Workflows



Pre Production



GitHub Actions
Azure App Service

Deployment Slots



Staging



Production



Deployment Slots



Staging

0%



Production

100%

Deployment Slots



Staging



Production

100%

A large circular progress bar with a thick blue outline, showing 100% completion. It is positioned below the Staging deployment slot icon.

0%

A large circular progress bar with a thin dark gray outline, showing 0% completion. It is positioned below the Production deployment slot icon.

Deployment Slots



Staging



Production

10%

90%

Demo



CI / CD with pre-production and UAT environments



Handling Keys and Credentials

Keeping secrets secret

GitHub Secrets

```
- name: Deploy to Website
  uses: azure/webapps-deploy@v2
  with:
    app-name: ${{ env.AZURE_WEBAPP_NAME }}
    publish-profile: ${{ secrets.PUBLISH_PROFILE_STAGING }}
    package: './Source/Tailwind.Traders.Web/staging'
```

GitHub Secrets

The screenshot shows the GitHub repository settings page for 'Damovisa / My Repository'. The 'Settings' tab is selected. A red box highlights the 'Secrets' link in the sidebar. Another red box highlights the 'New secret' button.

Options

- Manage access
- Security & analysis
- Branches
- Webhooks
- Notifications
- Integrations
- Deploy keys
- Secrets**
- Actions

Secrets

Secrets are environment variables that are **encrypted** and only exposed to selected actions. Anyone with **collaborator** access to this repository can use these secrets in a workflow.

Secrets are not passed to workflows that are triggered by a pull request from a fork. [Learn more](#).

AZURE_CREDENTIALS	Updated 13 days ago	Update	Remove
DOCKER_PASSWORD	Updated 13 days ago	Update	Remove
PUBLISH_PROFILE_STAGING	Updated now	Update	Remove

Azure Key Vault



Keys



Secrets



Certificates

Azure Key Vault

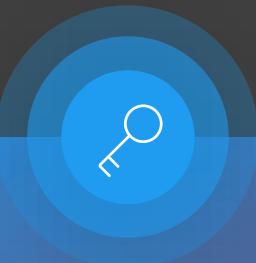
```
steps:
  - uses: actions/checkout@v2

  - uses: Azure/login@v1
    with:
      creds: ${{ secrets.AZURE_CREDENTIALS }}

  - uses: Azure/get-keyvault-secrets@v1.0
    with:
      keyvault: "TailwindTraders-AD040-KV"
      secrets: 'DockerPassword'
      id: kvSecretAction

  - uses: Azure/docker-login@v1
    with:
      login-server: tailwindtradersado40.azurecr.io
      username: tailwindtradersado40
      password: ${{ steps.kvSecretAction.outputs.DockerPassword }}
```

Future Ideas for Tailwind Traders



Rotate credentials in Key Vault when an admin asks a Teams Bot



Automatically build a new dev environment and fork a repository based on a properly-formatted issue



Pull commit messages since last production release and build release notes for customers

Summary



Add CD to your pipeline!



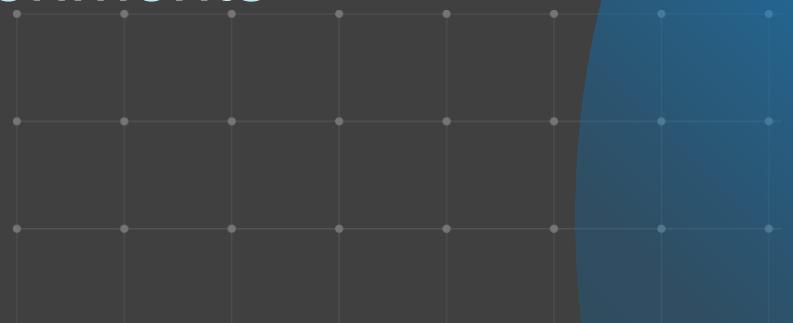
Continuously deploy *somewhere*



Protect production with GitHub Environments



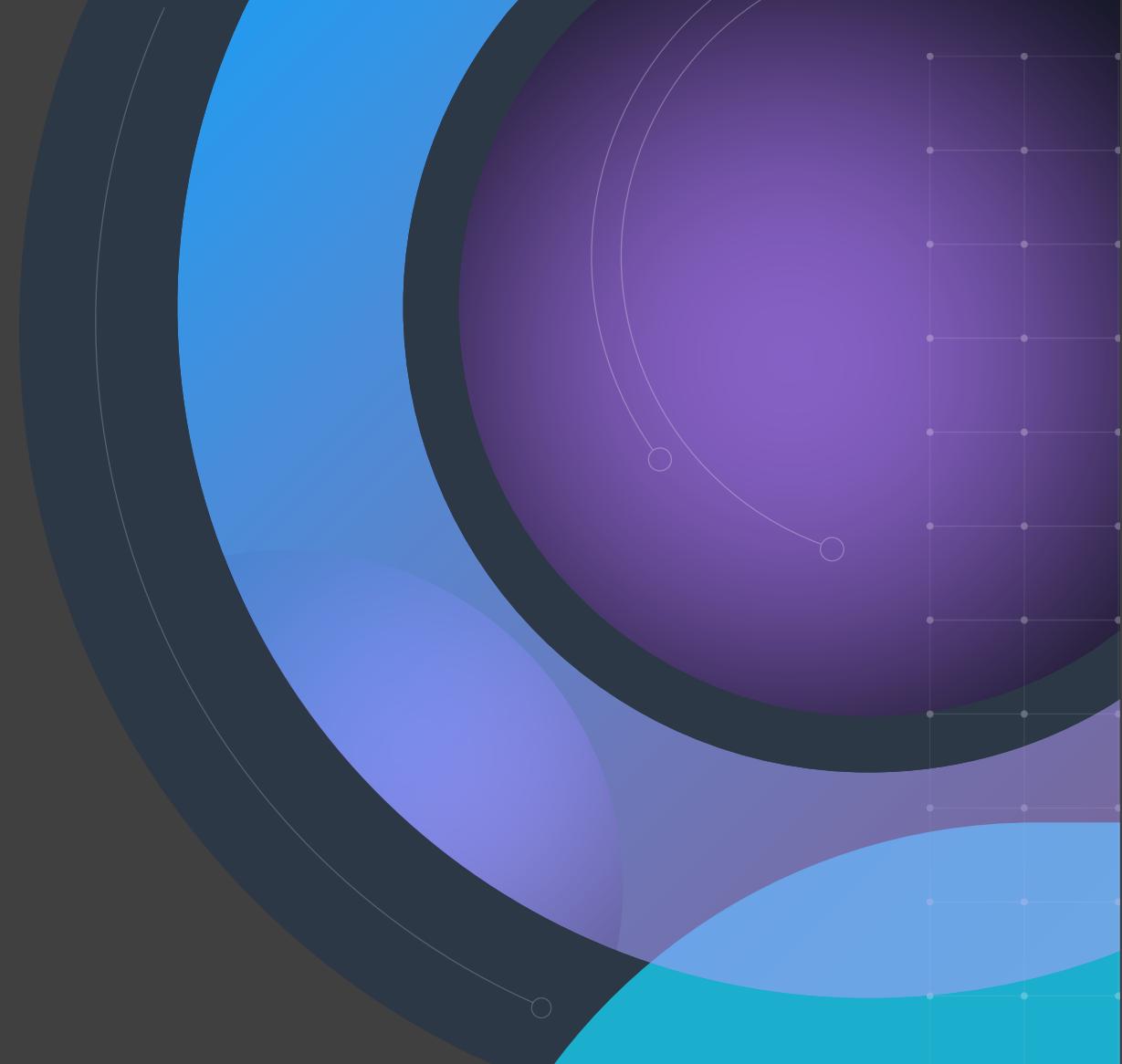
Centralize Secrets Storage





Building in Security and Quality

DevOps Learning Path



-  Getting Started with DevOps
-  Managing the Flow of Work
-  Delivering Change to the Cloud
-  Building in Security and Quality
-  Operating Software in the Cloud

Goals for this Session



Security

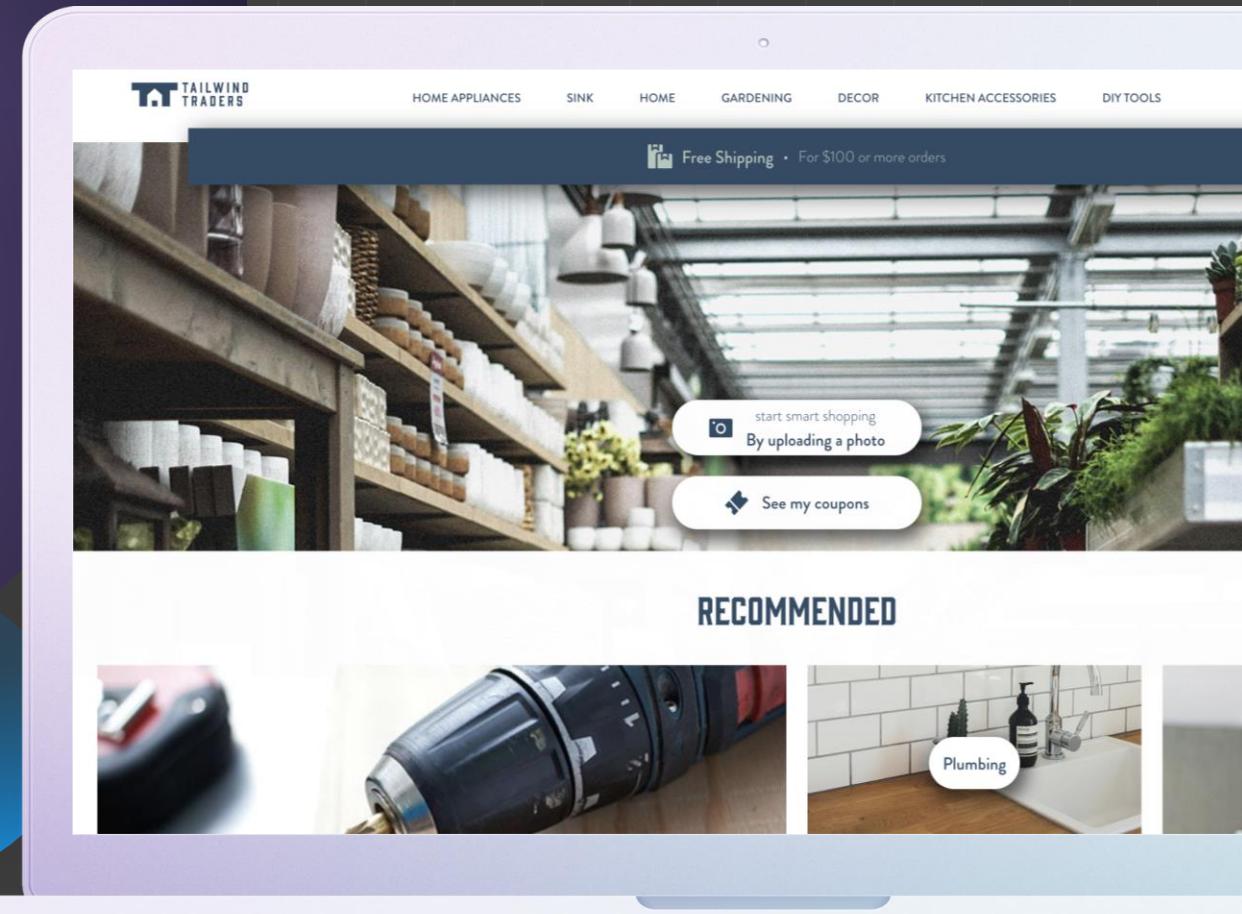


Apply Security
to Containers



Build Quality and Gain
Confidence

Tailwind Traders Website



Tailwind Traders Website

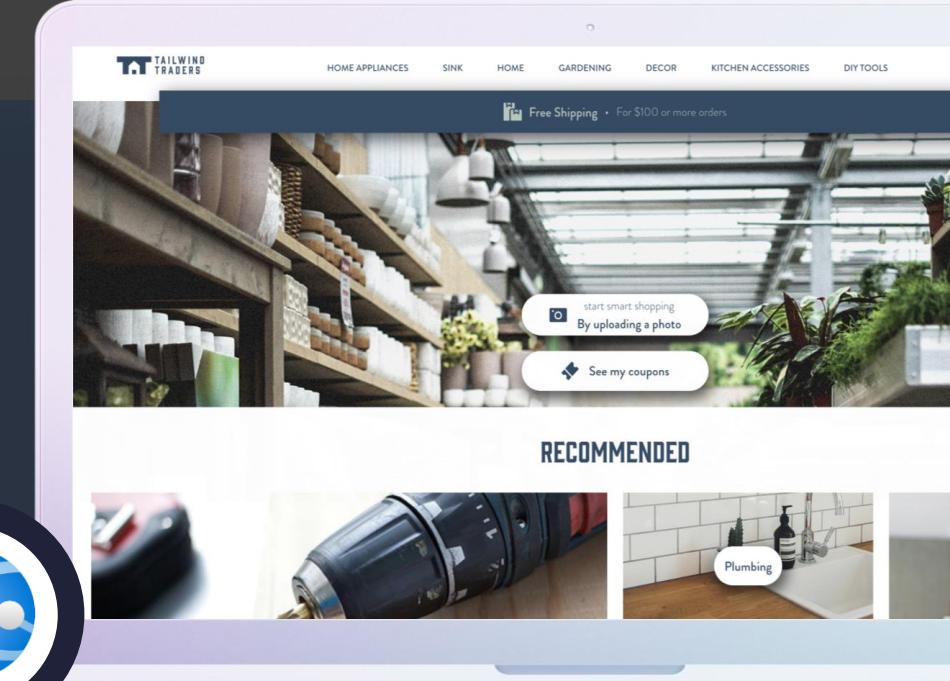
ASP.NET Core + React
Docker container on
Azure App Service



Azure SQL Database



Azure Cosmos DB



What Tailwind Traders Needs



Quality



Confidence



Security

Tailwind Traders Website

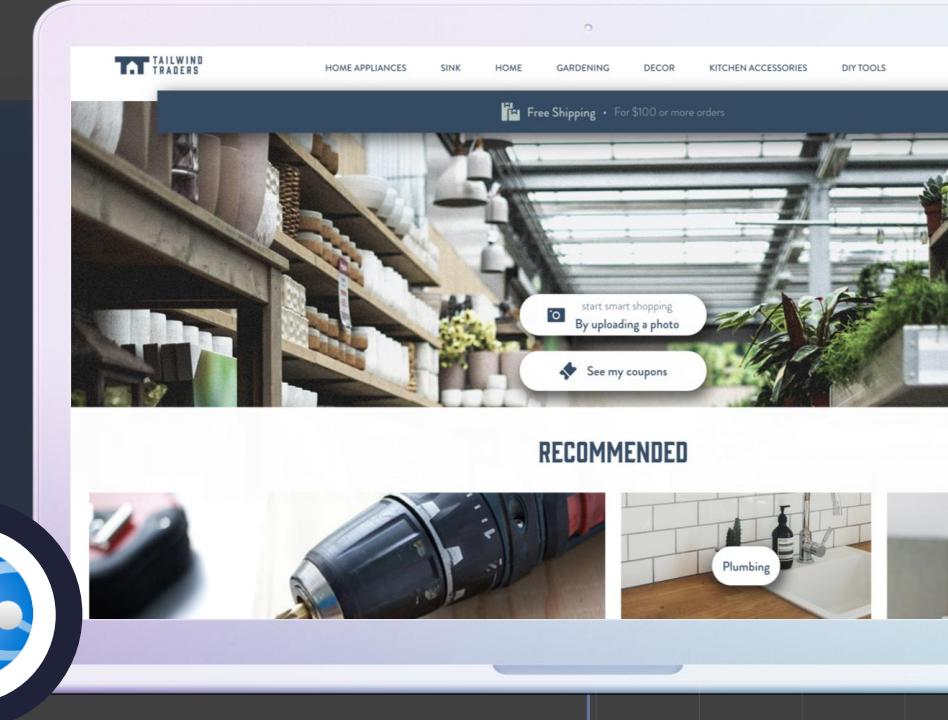
ASP.NET Core + React

Microservices with
backend APIs and Web
Frontend



Azure SQL Database

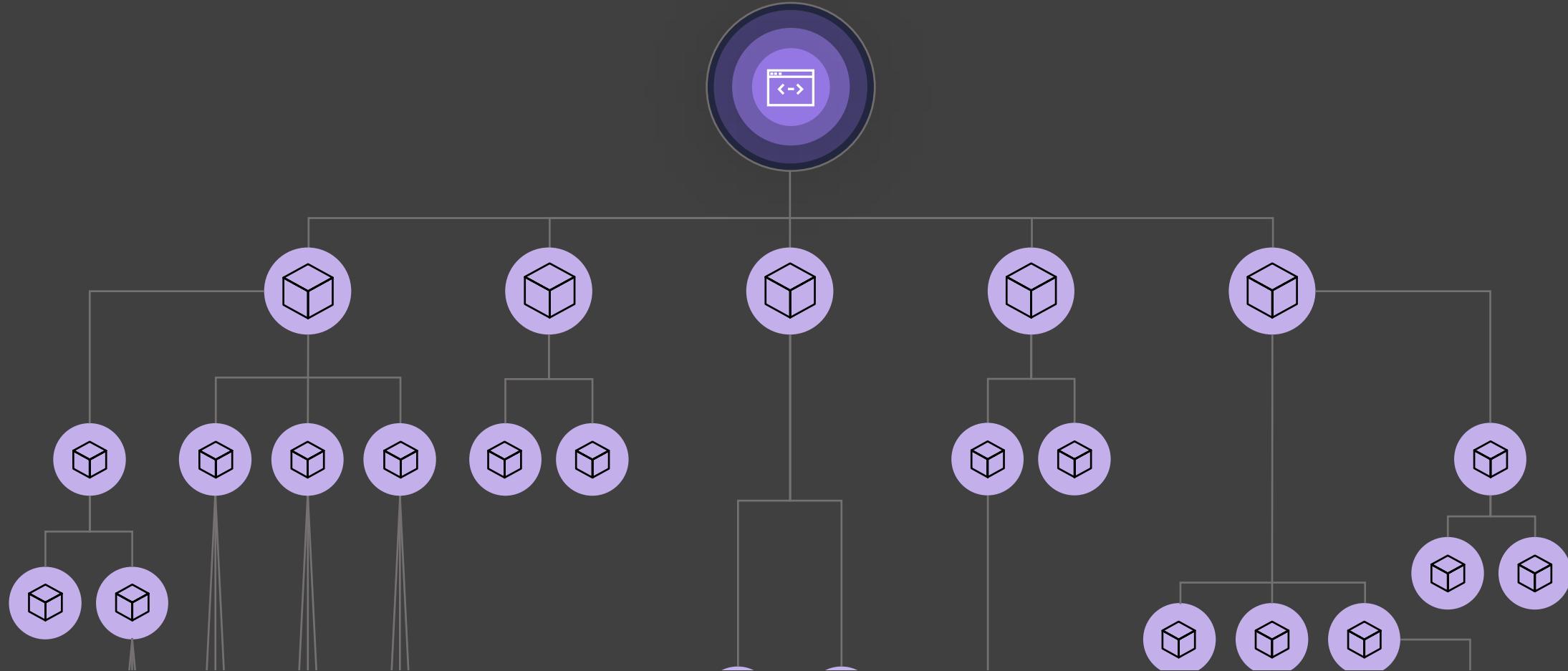
Azure Cosmos DB



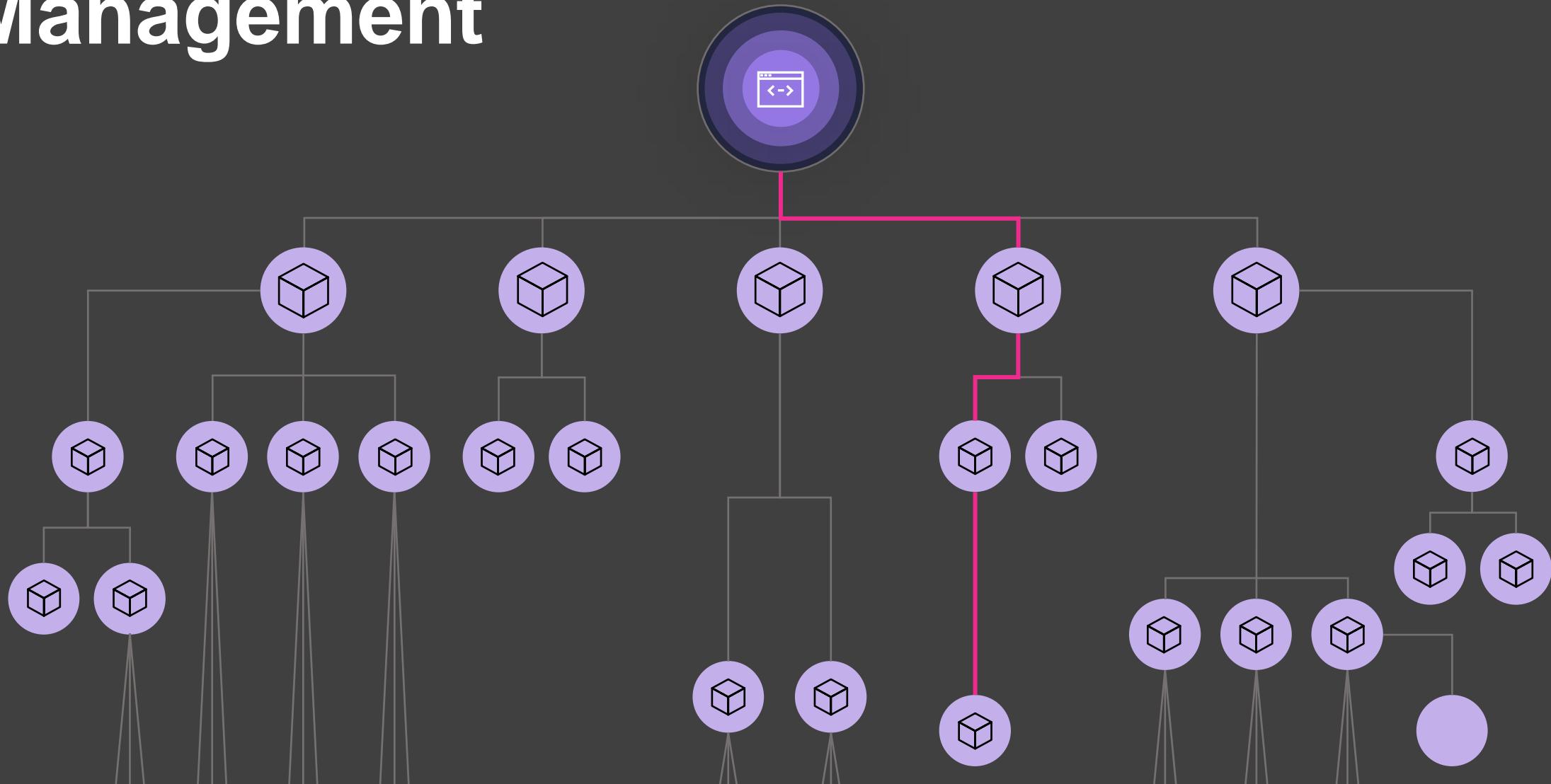
Security and Vulnerability Management



Security and Vulnerability Management



Security and Vulnerability Management



Where security fits in the development lifecycle

PRE-COMMIT

- Threat modeling
- IDE security plug-in
- Pre-commit hooks
- Secure coding standards
- Peer review



COMMIT (CI)

- Static code analysis
- Security unit tests
- Dependency management
- Credential scanning



OPERATE & MONITOR

- Continuous monitoring
- Threat intelligence
- Blameless postmortems



DEPLOY (CD)

- Infra as code (IaC)
- Security scanning
- Cloud configuration
- Security acceptance tests



What Tailwind Traders Need



Dependency Insights

- Real-time inventory
- License compliance
- Vulnerability alerting



Vulnerability Management

- Code scanning
- Secret scanning
- Largest vulnerability database
- Automated security updates



CodeQL

- World's most advanced code analysis
- Vulnerability hunting tool
- Community of top security experts

Vulnerability Management

Over 62 million security alerts sent across GitHub.

The screenshot shows a laptop displaying the GitHub interface. The top navigation bar includes 'Code', 'Issues 2', 'Pull requests 7', 'Actions', 'Security' (which is highlighted in orange), 'Insights', and 'Settings'. Below the navigation is a sidebar with 'Alerts', 'Advisories', and 'Policy' sections. A note in the sidebar states: 'You are in the [Beta](#) of automated security fixes. [Opt out](#) or [give us feedback](#)'. Another link says 'Learn more about automated security fixes.' The main content area is titled 'Security Alerts' and lists nine open vulnerabilities:

- eslint-utils (Severity: !, by GitHub, package-lock.json, #13)
- lodash (Severity: !, by GitHub, package-lock.json, #12)
- lodash.template (Severity: !, by GitHub, package-lock.json, #11)
- lodash.mergeWith (Severity: !, by GitHub, package-lock.json, #10)
- lodash.defaultsDeep (Severity: !, by GitHub, package-lock.json, #9)
- js-yaml (Severity: !, by GitHub, package-lock.json, #8)
- fstream (Severity: !, by GitHub, package-lock.json, #7)

Code Scanning



Find and fix vulnerabilities fast

Find and fix vulnerabilities before they are merged into the code base with automated CodeQL scans



Community of top security experts

Community-driven query set powers every project with a world-class security team



Integrated with developer workflow

Integrate security results directly into the developer workflow for a frictionless experience and faster development

The screenshot shows a GitHub pull request page for the repository `github / lgtni`. The pull request is titled "Allow the webhook to send a base64 gzip sarif file #33". The code review section highlights a change in `app/controllers/webhooks_controller.rb`. The diff shows:

```
diff --git a/app/controllers/webhooks_controller.rb b/app/controllers/webhooks_controller.rb
@@ -14,7 +14,11 @@ def create
   commit_oid = payload.dig(:check_run, :head_sha)
   repo_id = payload.dig(:repository, :id)
 
-17 + sarif_json = JSON.parse(check_run["text"])
-17 + begin
-18 +   sarif_json = parse_check_run_payload_text_as_json(check_run)
+19 + rescue
+20 +   raise ActionController::BadRequest, "The check_run text is not a JSON text nor a base64(gzip(JSON))."
+21 + end
+18 22   CodeScanResult.import_sarif(sarif_json, commit_oid: commit_oid, repository_id: repo_id)
+19 23 end
+20 24 head :accepted
```

A red error icon is shown next to the line `-17 + sarif_json = JSON.parse(check_run["text"])`, indicating a security issue: "Improper Neutralization of Directives in Dynamically Evaluated Code". The tooltip states: "The software receives input from an upstream component, but it does not neutralize or incorrectly neutralizes code syntax before using the input in a dynamic evaluation call".

Secret Scanning

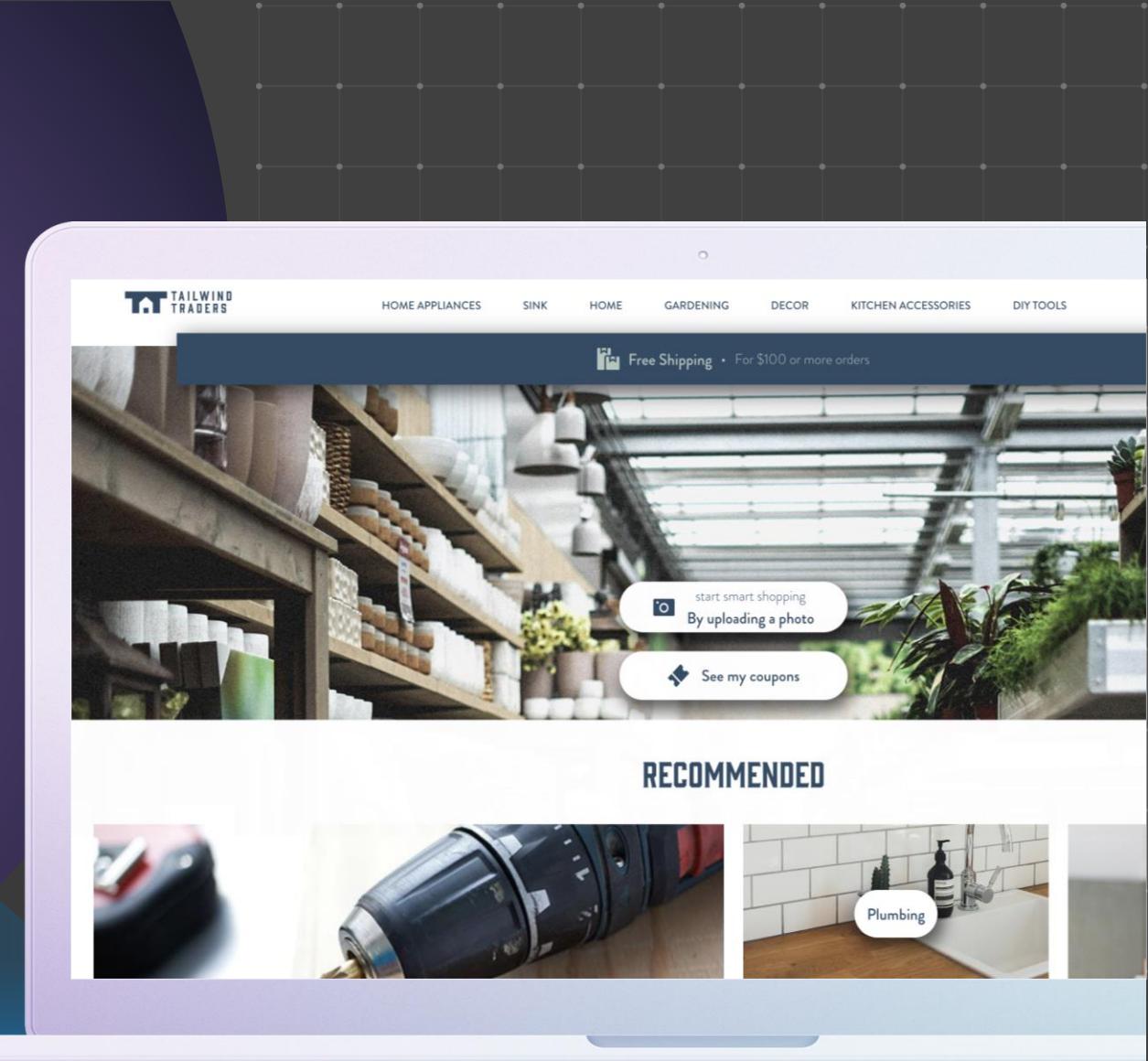
Scan for leaked secrets in public and private repos.

The screenshot shows the GitHub interface for managing security alerts. At the top, there are tabs for Code, Issues (2), Pull requests (7), Actions, Security (highlighted in orange), Insights, and Settings. The main area is titled "Security Alerts". It displays a list of findings with the following details:

Alert Type	Dependency	Fix Status	Comments
⚠️ Open	eslint-utils	by GitHub package-lock.json #13	
⚠️ Open	lodash	by GitHub package-lock.json #12	
⚠️ Open	lodash.template	by GitHub package-lock.json #11	
⚠️ Open	lodash.mergeWith	by GitHub package-lock.json #10	
⚠️ Open	lodash.defaultsDeep	by GitHub package-lock.json #9	
⚠️ Open	js-yaml	by GitHub package-lock.json #8	
⚠️ Open	fstream	by GitHub package-lock.json #7	

A sidebar on the left contains links for Alerts, Advisories, and Policy. A note in the center states: "You are in the **Beta** of automated security fixes. [Opt out](#) or [give us feedback](#)". There is also a link to "Learn more about automated security fixes".

Tailwind Traders Website



GitHub Security



Code Scanning

Find and fix vulnerabilities before they are merged into the code base with automated CodeQL scans



Scan containers

Scan for common vulnerabilities in Docker images before pushing them to a container registry or deploying them to a containerized web app or Kubernetes cluster



Manage secrets using Azure Key Vault

Dynamically pull secrets from an Azure Key Vault instance for consumption in GitHub Action workflows

The screenshot shows the GitHub interface with the 'Security' tab selected. The 'Code scanning' section is displayed, showing the latest scan was 7 days ago, and there are 9 open alerts. The alerts listed include:

- Disabling certificate validation (High)
- Creating an ASP.NET debug binary may reveal sensitive information (Medium)
- Disabled Spring CSRF protection (Medium)
- Missing X-Frame-Options HTTP header (High)
- ASP.NET config file enables directory browsing (Medium)
- Cross-site scripting (Medium)
- Cross-site scripting (Medium)



Demo

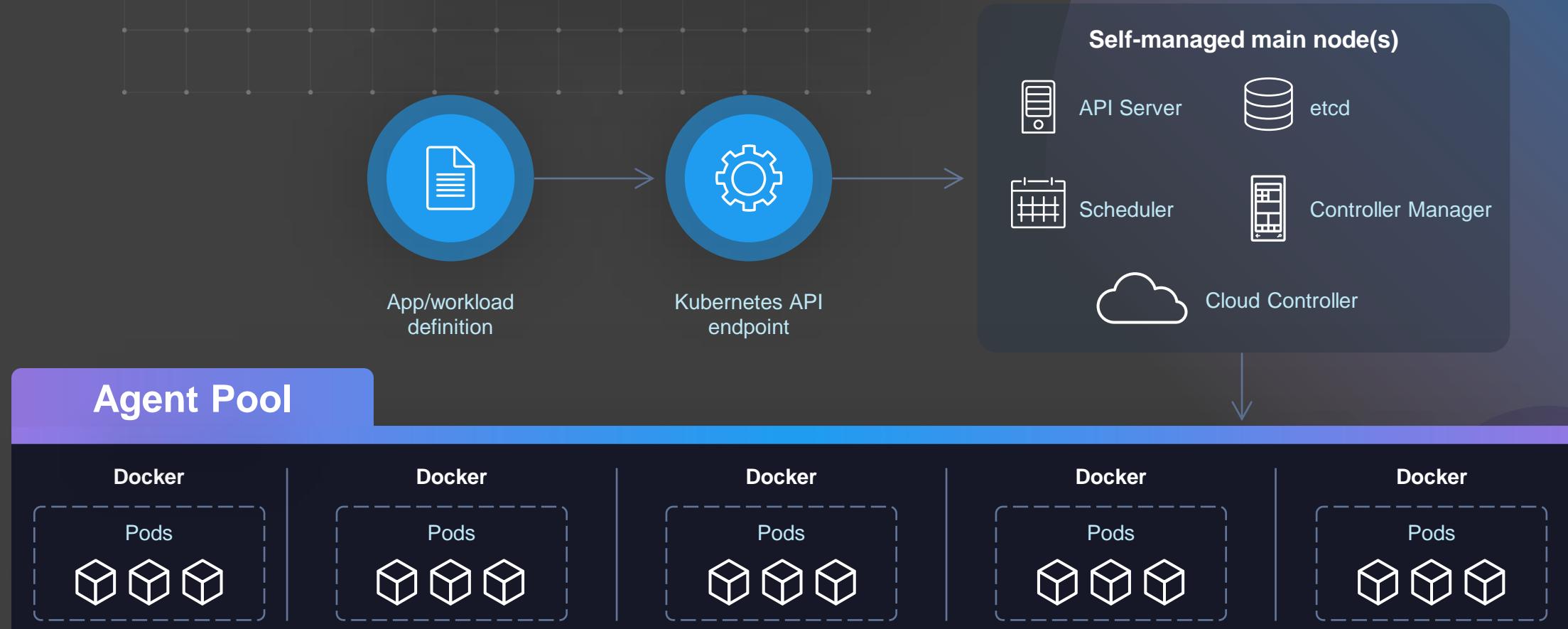


Azure Security and GitHub
Advanced Security

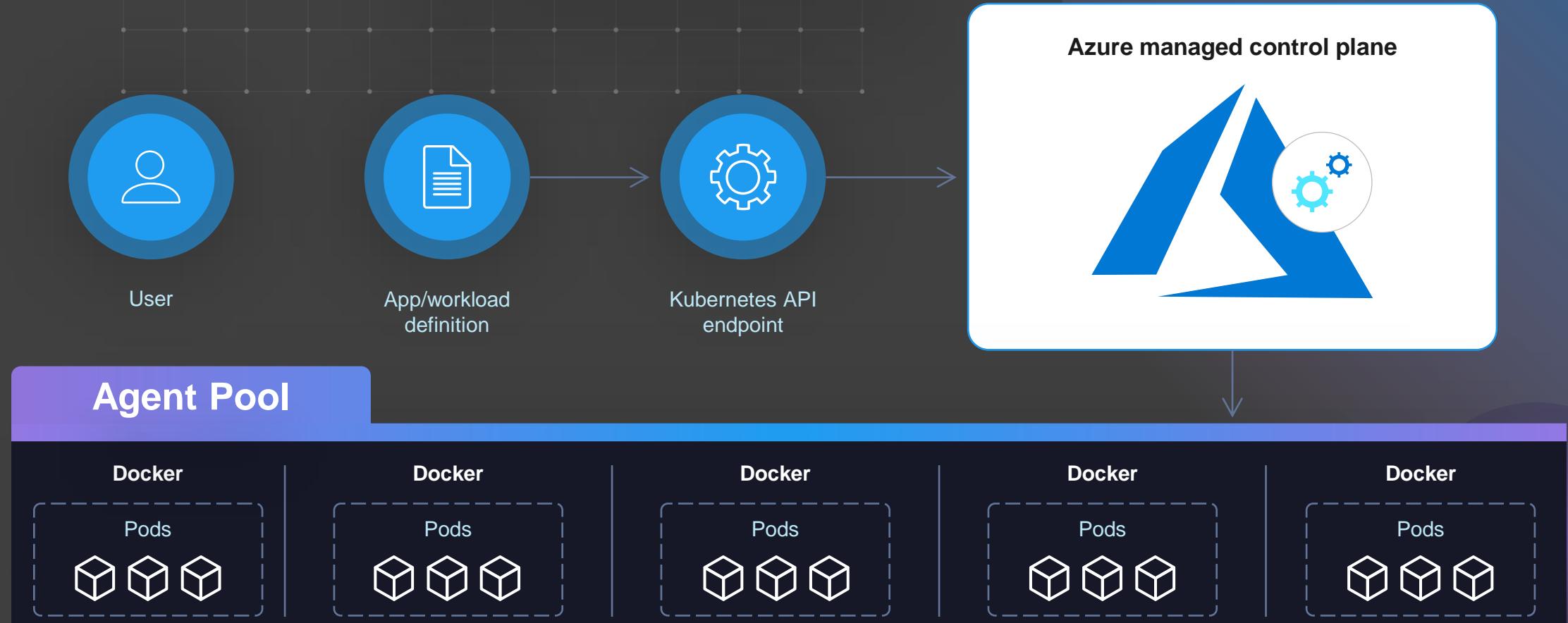
Container Security



Kubernetes Architecture



Kubernetes Architecture



Refresher on container layers



Container Layer

91e49dfb1179

d7b1189bf667

c220123c8472

d31af33eb855

a7183fb762a8

f61792ba8979

• • •

From: Alpine:3.8

Read/Write

Image Layers

Read Only

Demo



Building Secure Containers

End-to-end, code-to-cloud DevOps



Home for all
developers

Home for the
world's code

- Elastic, to any scale
- Fully managed
- Packages always the latest
- Supports all OS for CI/CD
- Largest ecosystem
- Community-led automation

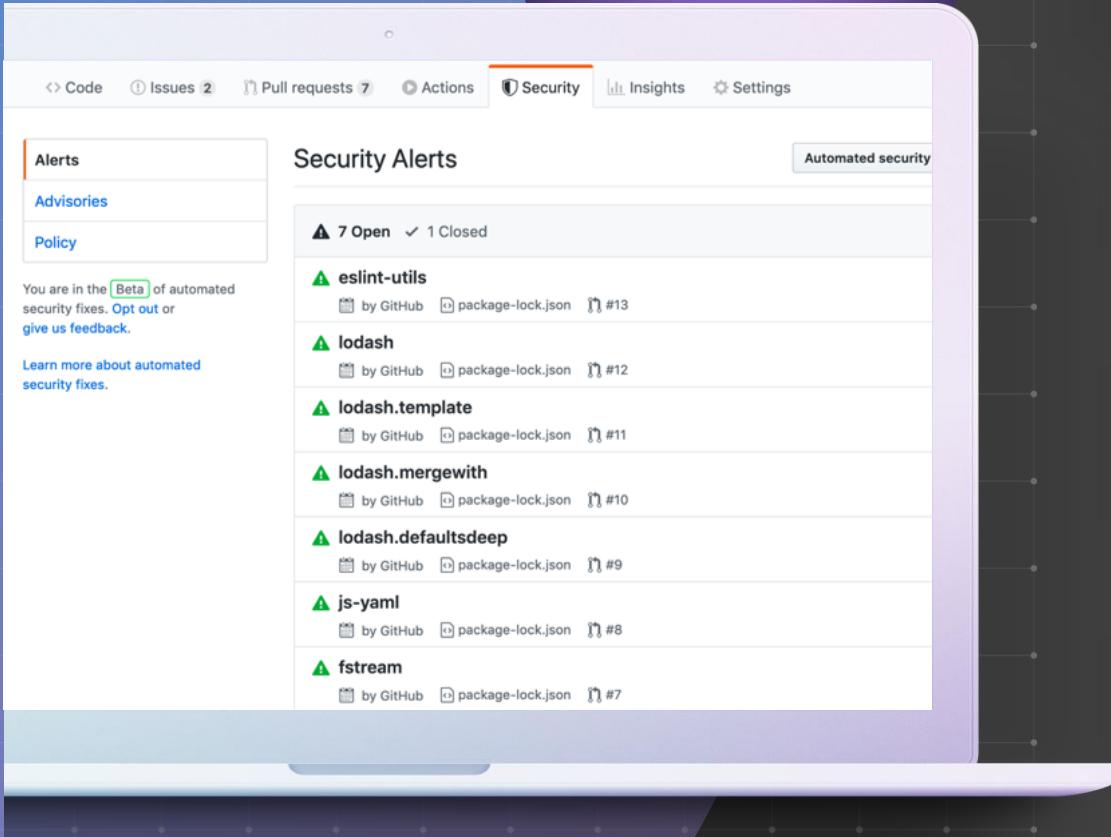


Deploy anywhere,
including your own
data centers

- On-prem
- Azure
- AWS
- Google Cloud Platform

HARDENING DEVOPS INFRASTRUCTURE

GitHub



Code



Develop



Secure



Collaborate



Automate



Community



Quality

Demo



Gaining DevOps Confidence

Bridge to Kubernetes



Simplifies microservice development

Eliminates the need to manually source, configure, and compile external dependencies



Streamlines application development

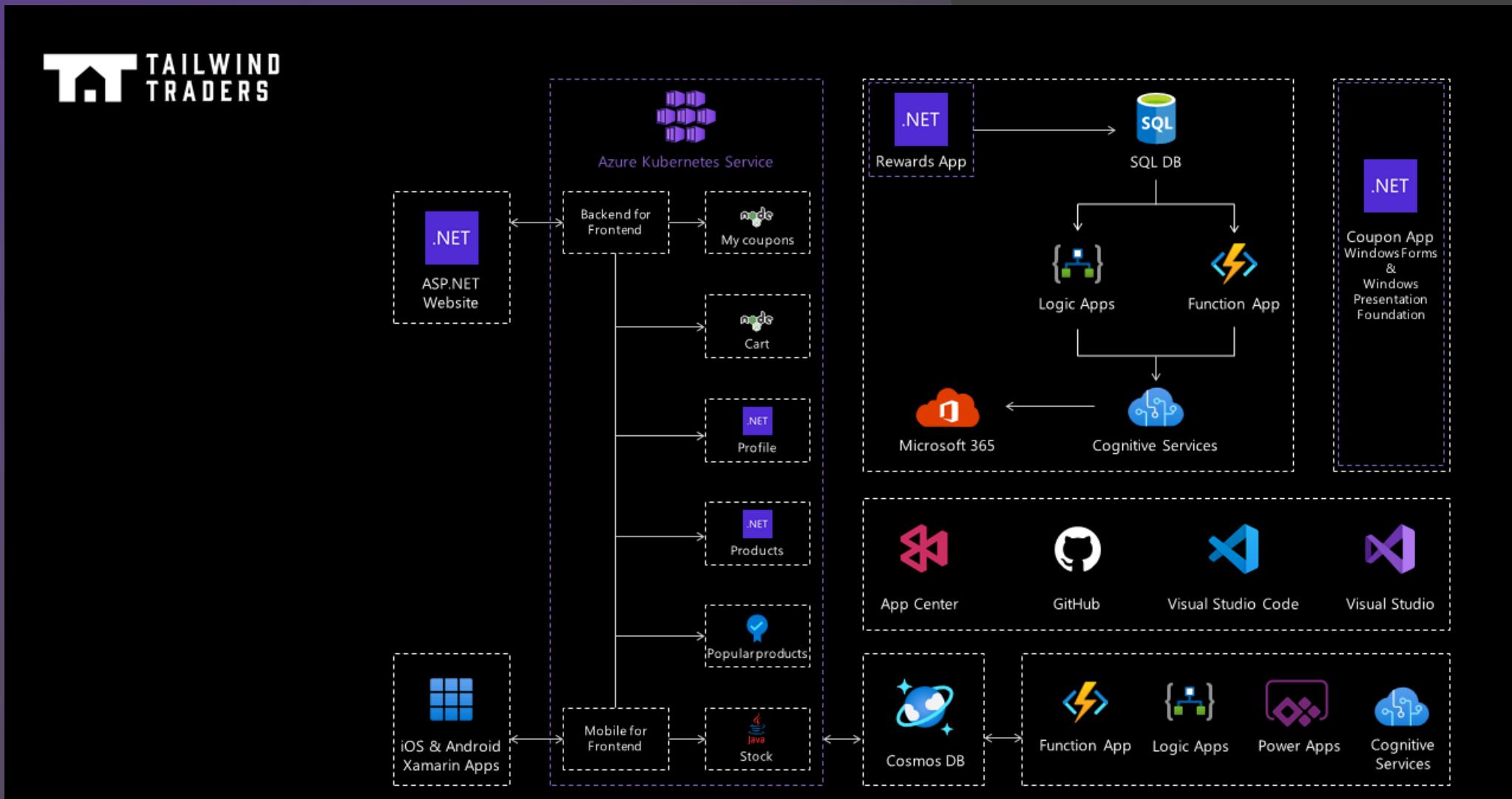
Sidestep operational complexities of building and deploying code into the cluster to test and debug

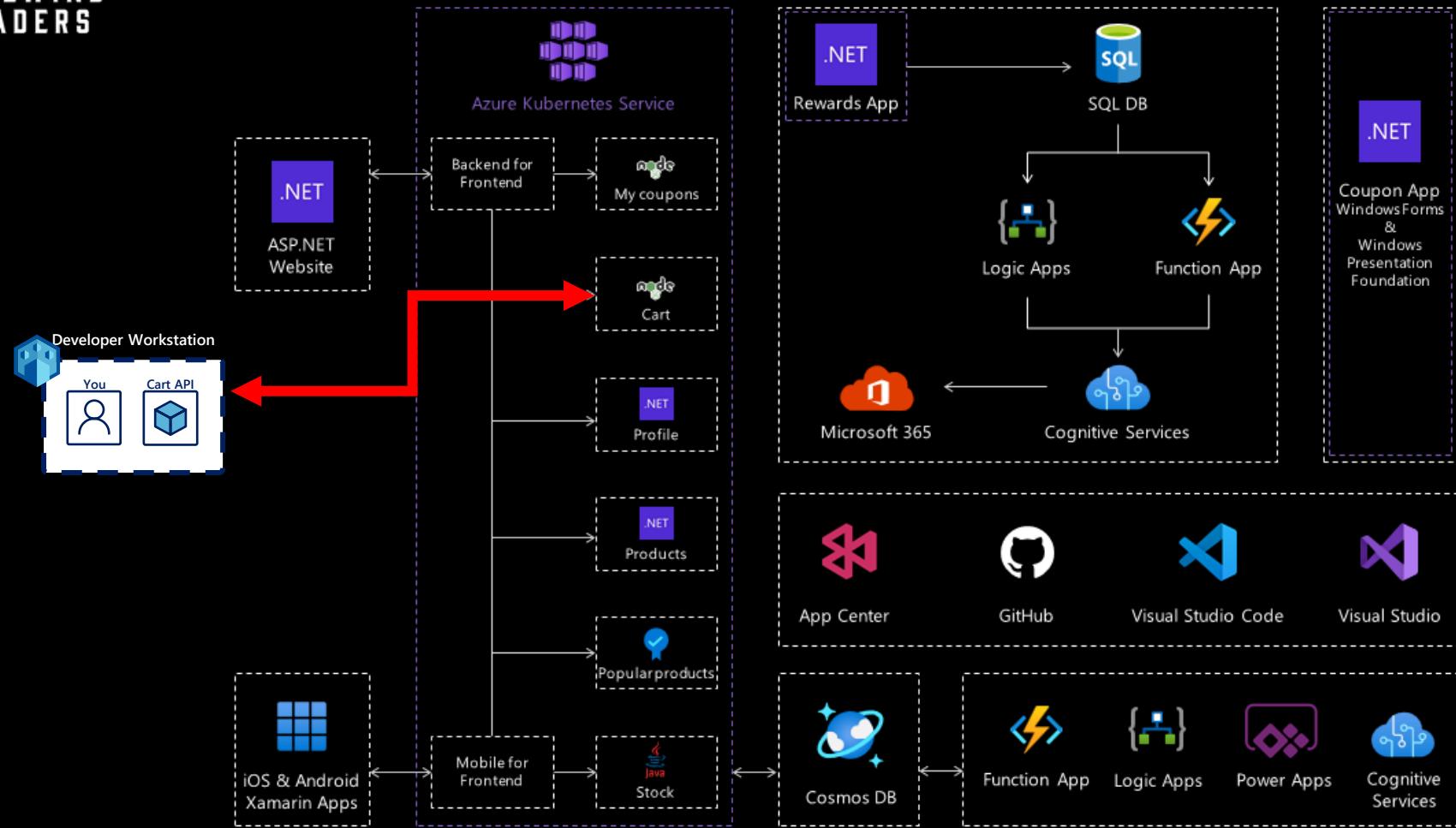


Work in isolation in shared development environment

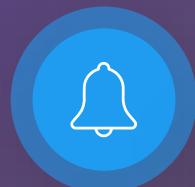
Work in a private “sandbox” environment by routing specific traffic locally







GitHub Actions



Automate



Build, test and deploy with
confidence



Customizable

A screenshot of a GitHub pull request page for the repository `pied-piper-inc/fib-module`. The pull request is titled "Create nodejs.yml #22" and is from the user `jeremyepling`. It shows 1 commit, 3 checks, and 1 file changed. The checks section indicates that some CI builds are still in progress. A note at the bottom states that the branch has no conflicts with the base branch and merging can be performed automatically.

Search or jump to... Pull requests Issues Marketplace Explore

pied-piper-inc / fib-module Private

Code Issues 0 Pull requests 1 Actions Projects 0 Wiki Security Insights Settings

Create nodejs.yml #22

Open jeremyepling wants to merge 1 commit into master from jeremyepling-patch-14

Conversation 0 Commits 1 Checks 3 Files changed 1

jeremyepling commented now
No description provided.

Create nodejs.yml Verified f07d9c9

Add more commits by pushing to the jeremyepling-patch-14 branch on pied-piper-inc/fib-module.

Some checks haven't completed yet Hide all checks

- Node CI / build (8.x) (push) In progress — This check has started...
- Node CI / build (10.x) (push) In progress — This check has started...
- Node CI / build (12.x) (push) In progress — This check has started...

This branch has no conflicts with the base branch Merging can be performed automatically.

Watch 0 Star 0 Fork 2

Reviewers No reviews

Assignees No one—assign yourself

Labels None yet

Projects None yet

Milestone No milestone

Notifications Customize

Unsubscribe You're receiving notifications because you authored the thread.

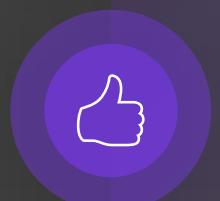
What did we learn?



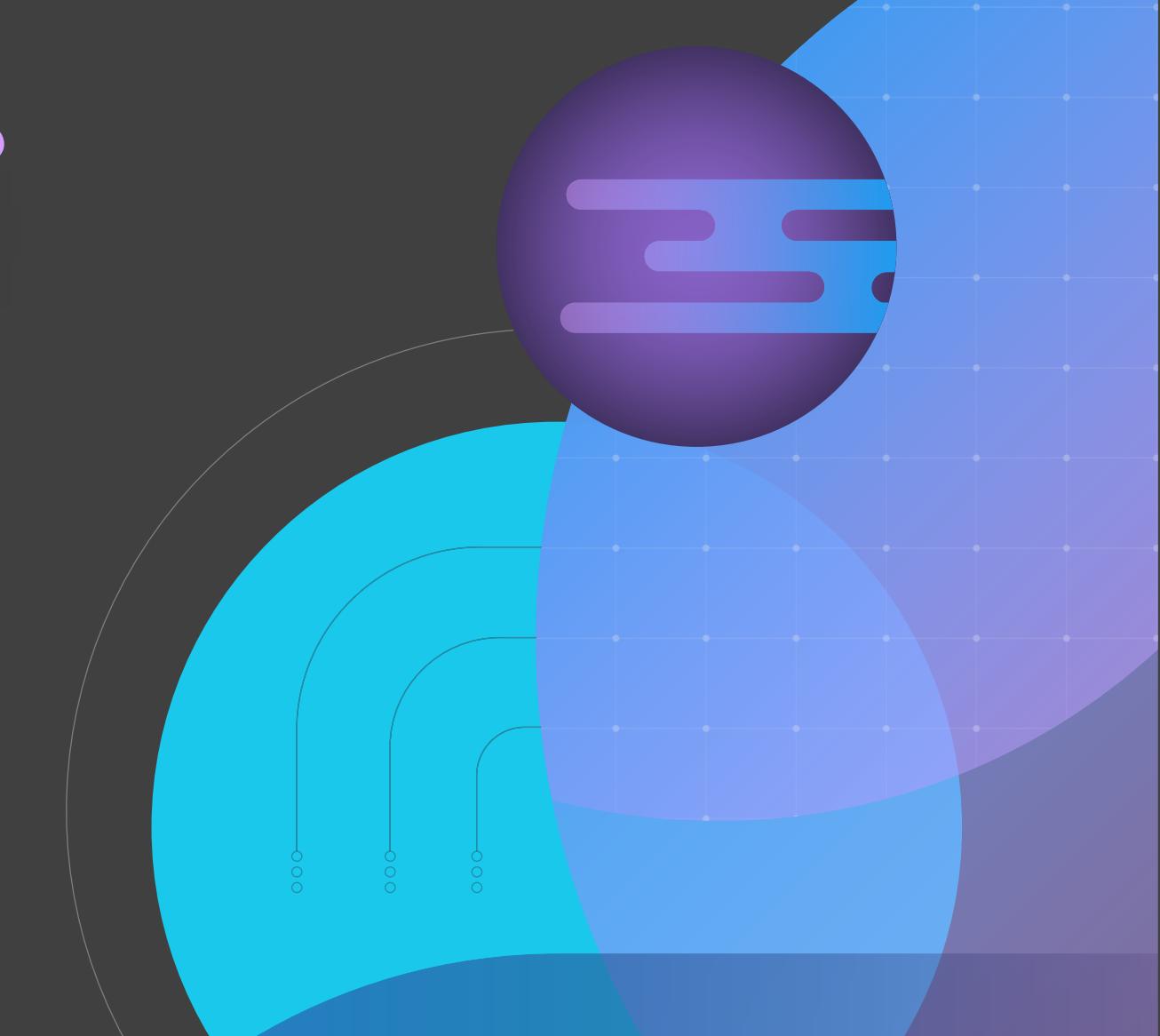
Code Scanning and
Dependency Alerts

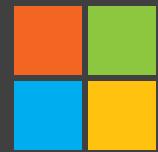


Build More Secure Containers



Gain DevOps Confidence





Microsoft Azure

Invent with purpose.



Operating Software in the Cloud



Welcome to the
Tailwind Team





HOME APPLIANCES SINK HOME GARDENING DECOR KITCHEN ACCESSORIES DIY TOOLS

Login

Free Shipping • For \$100 or more orders

start smart shopping
By uploading a photo

RECOMMENDED



Plumbing



Electrical

Agenda

Understanding Application Behavior

Creating Visibility in Production



Responsible Incident Response

If no one is on-call, everyone is



Guiding Incident Response with Automation

Using computers to help people do the right things





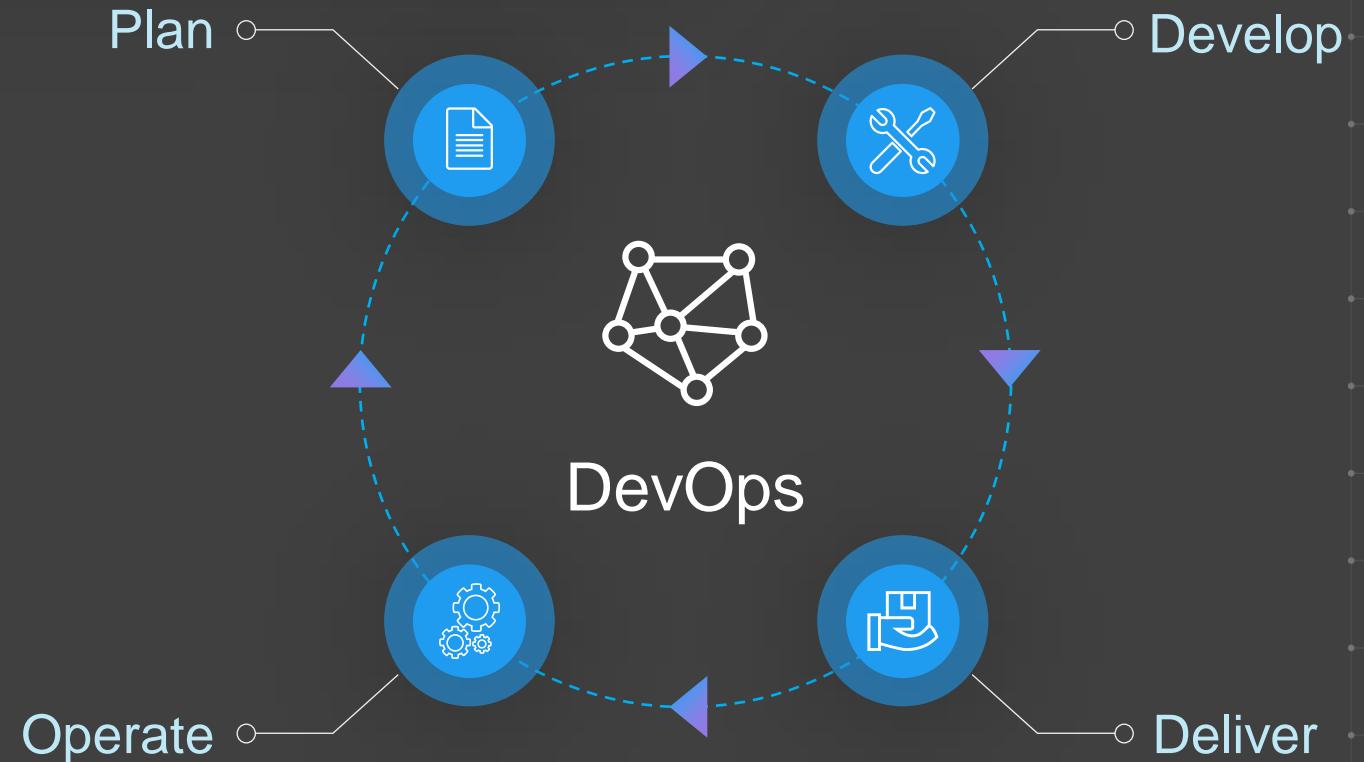
What is DevOps?



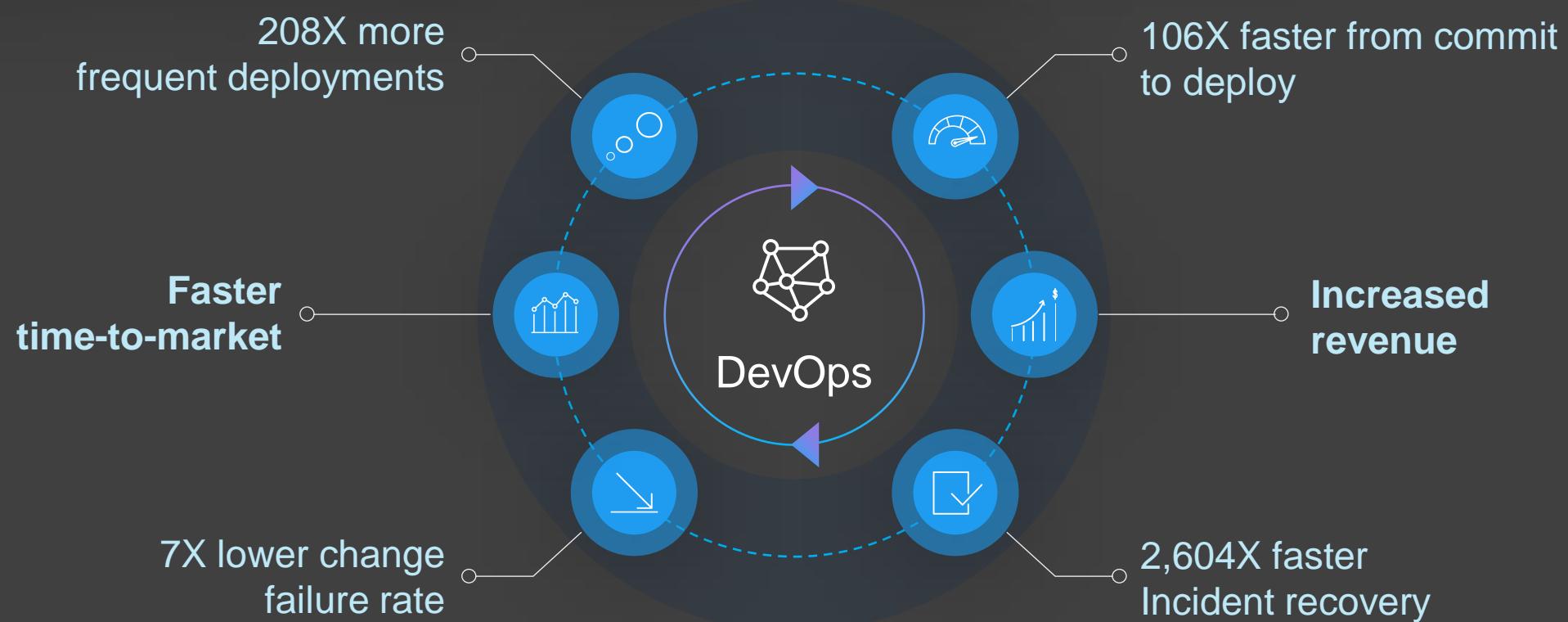
DevOps Accelerates Delivery

“

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



High performance DevOps Companies Achieve Developer Velocity by...



Source: 2019 DORA

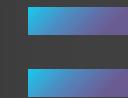
People



DEV

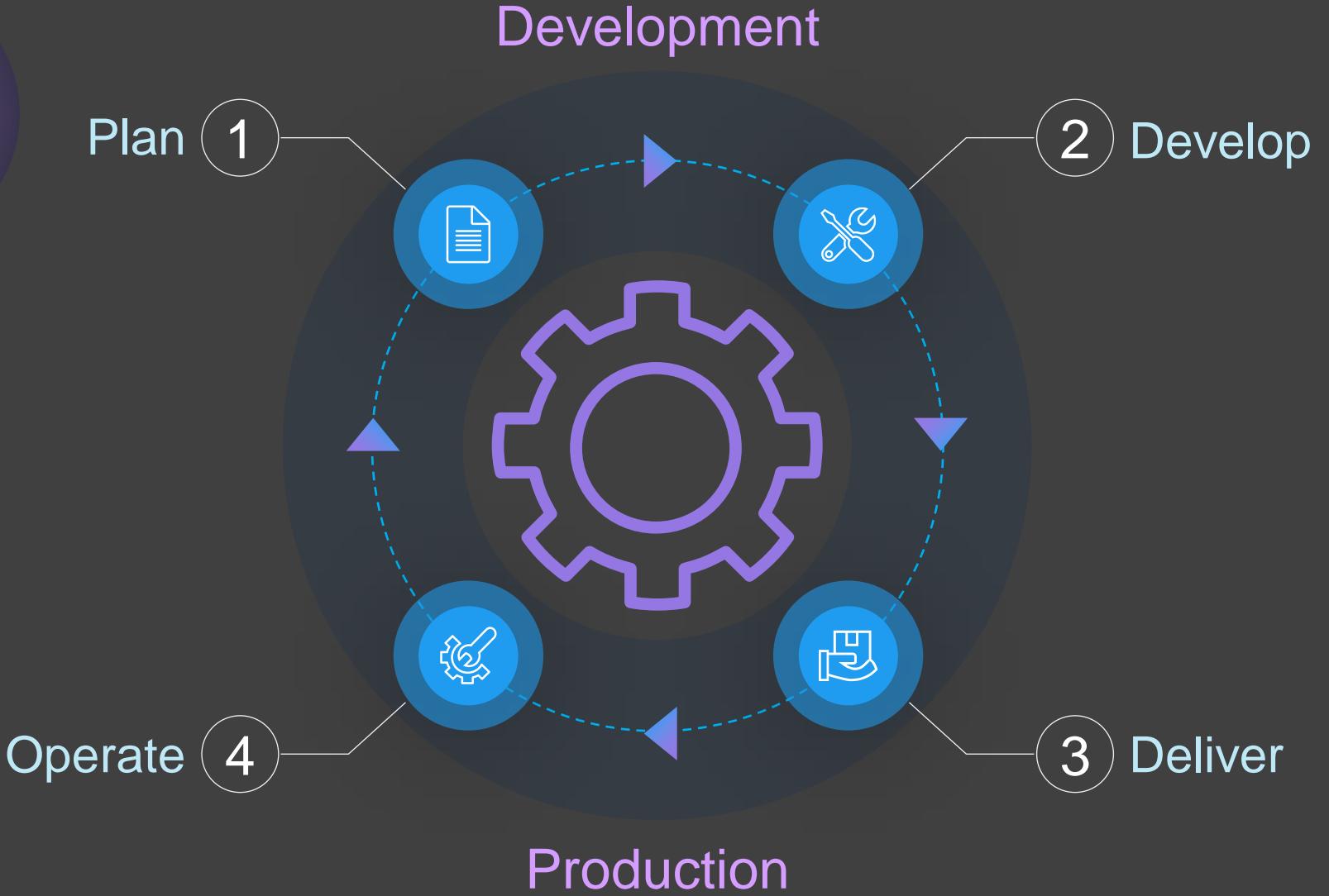


OPS



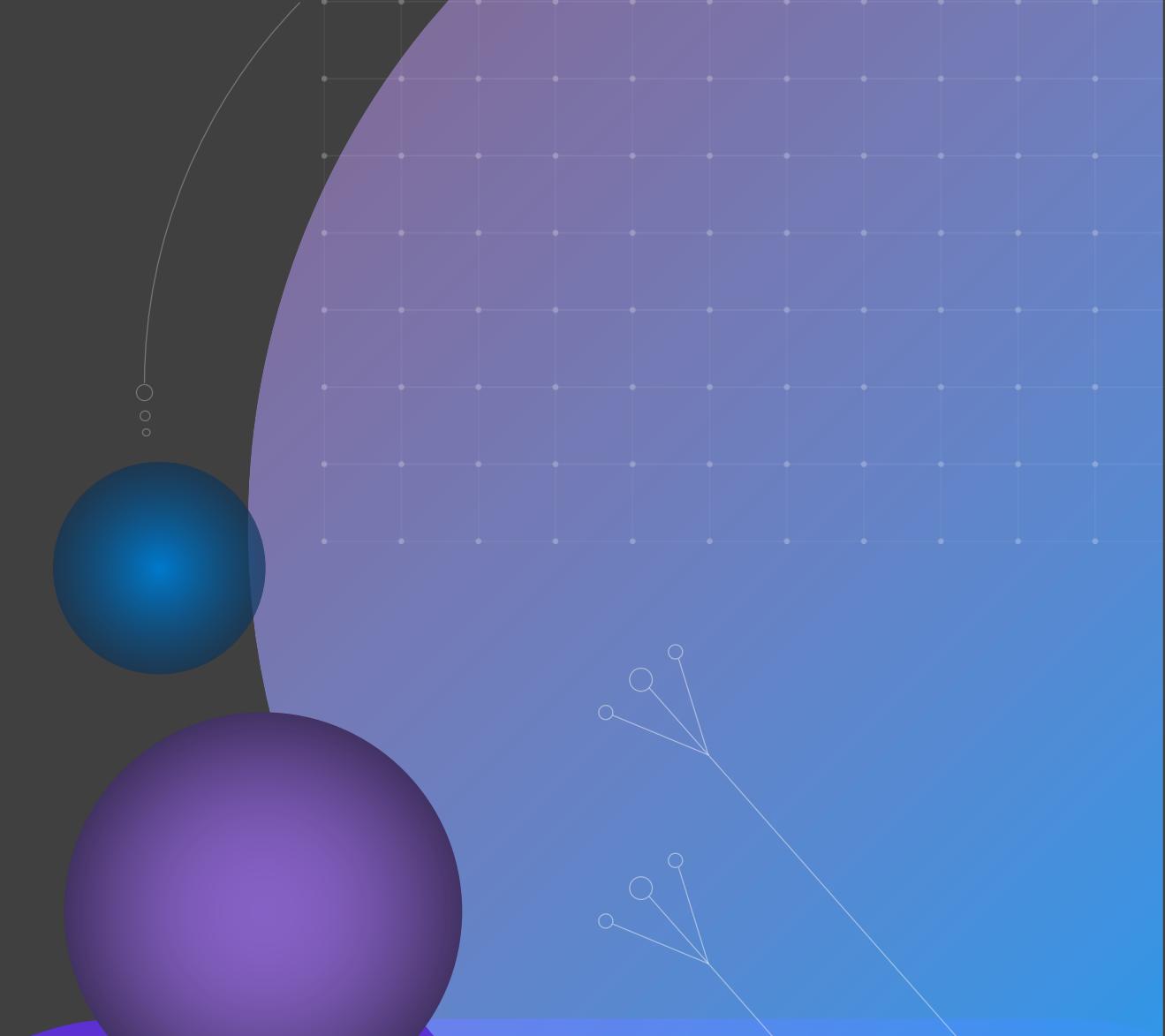
WALL OF CONFUSION

Process





Understanding Application Behavior in Production



The Goals for Monitoring our Production Systems

Improve Time to Detect

Reduce Time to Mitigate/Remediate

Enable Validated Learning



Sources of Monitoring Data

Real User
Monitoring



Synthetic
Transactions



Telemetry



Defining Effective Monitoring

What and why?

Over what time period?

Who needs to know?



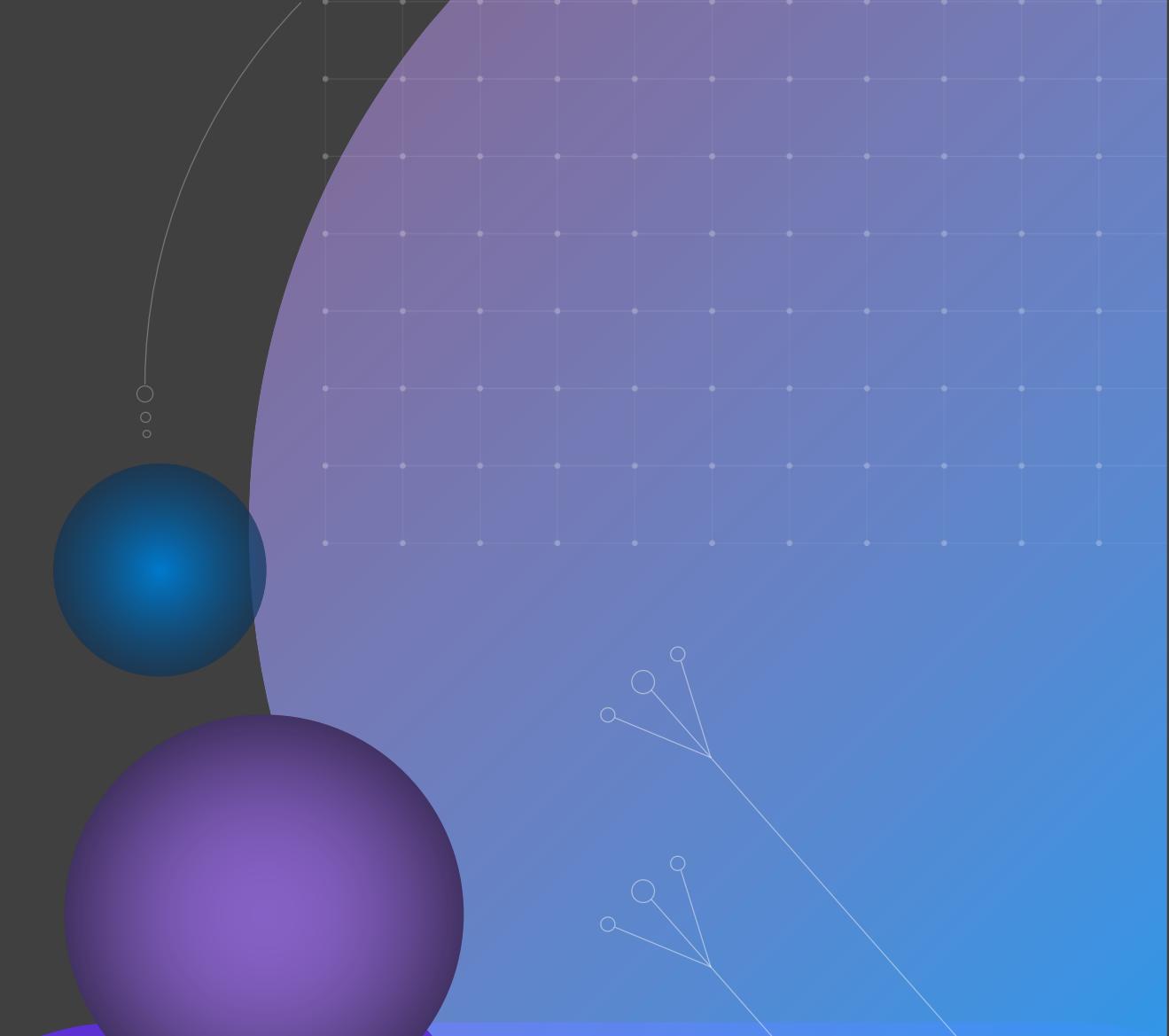
Demo



From Instrumentation to Alerting



Responsible Incident Response



Disaster Strikes!

API calls are failing!

Email notifications
went out... to
everyone

And time goes by...

Establishing a Basic Designated Responsible Individual Rotation



Create a shared DRI Schedule



Identify an escalation path



Define response time targets

The DRI is Responsible for



Responding to alerts/incidents in the defined time window

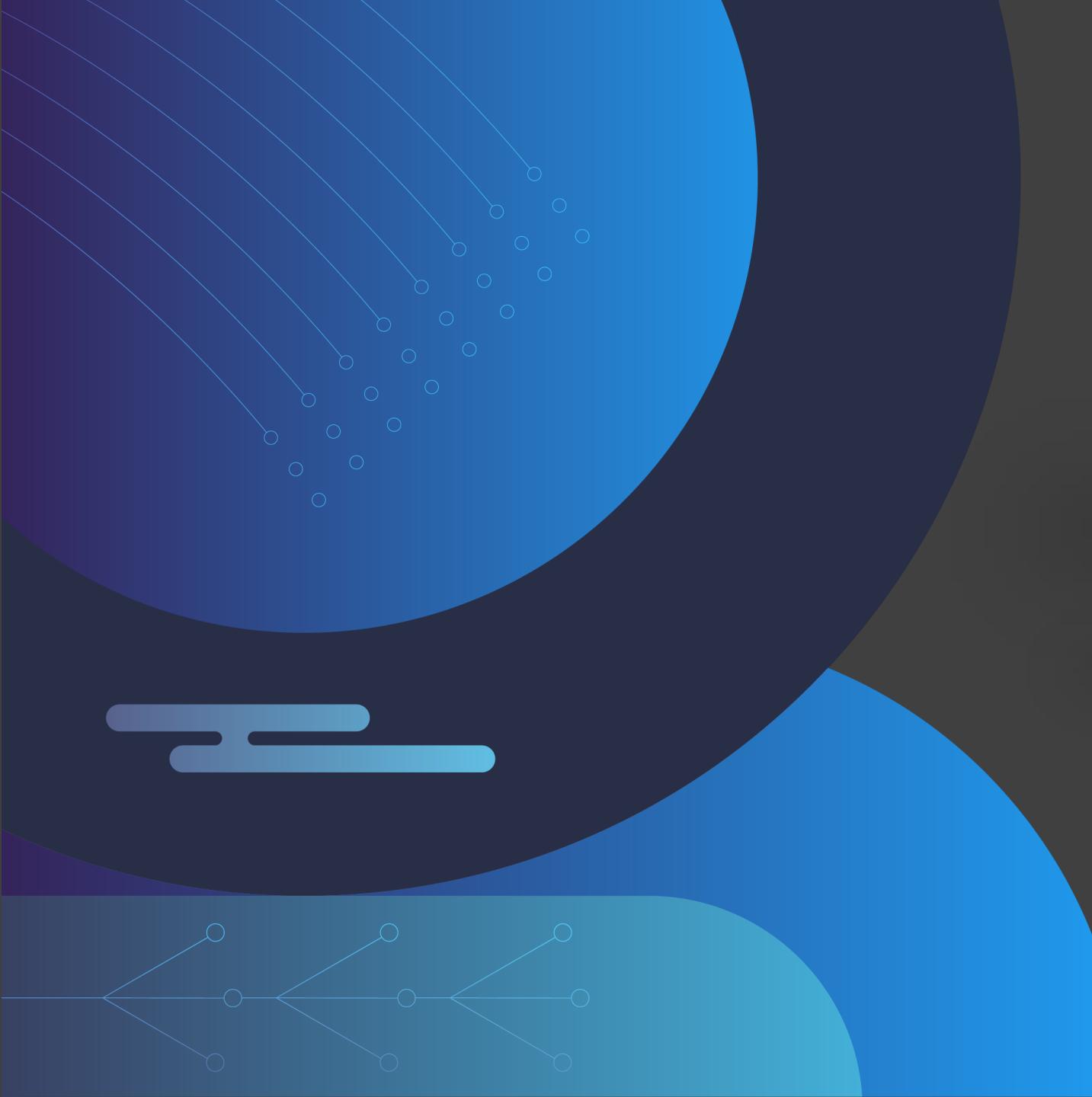


Coordinating with partner service DRIs



Ensuring the proper escalation of severe or long-running issues

Demo



Defining our DRI/On-Call Schedule

Incident Response

Incident Notifications
are not:

Broadly
distributed



Informational
only



Heartbeat or
logging



Incident Response

Incident Notifications
are not:

Specifically
directed

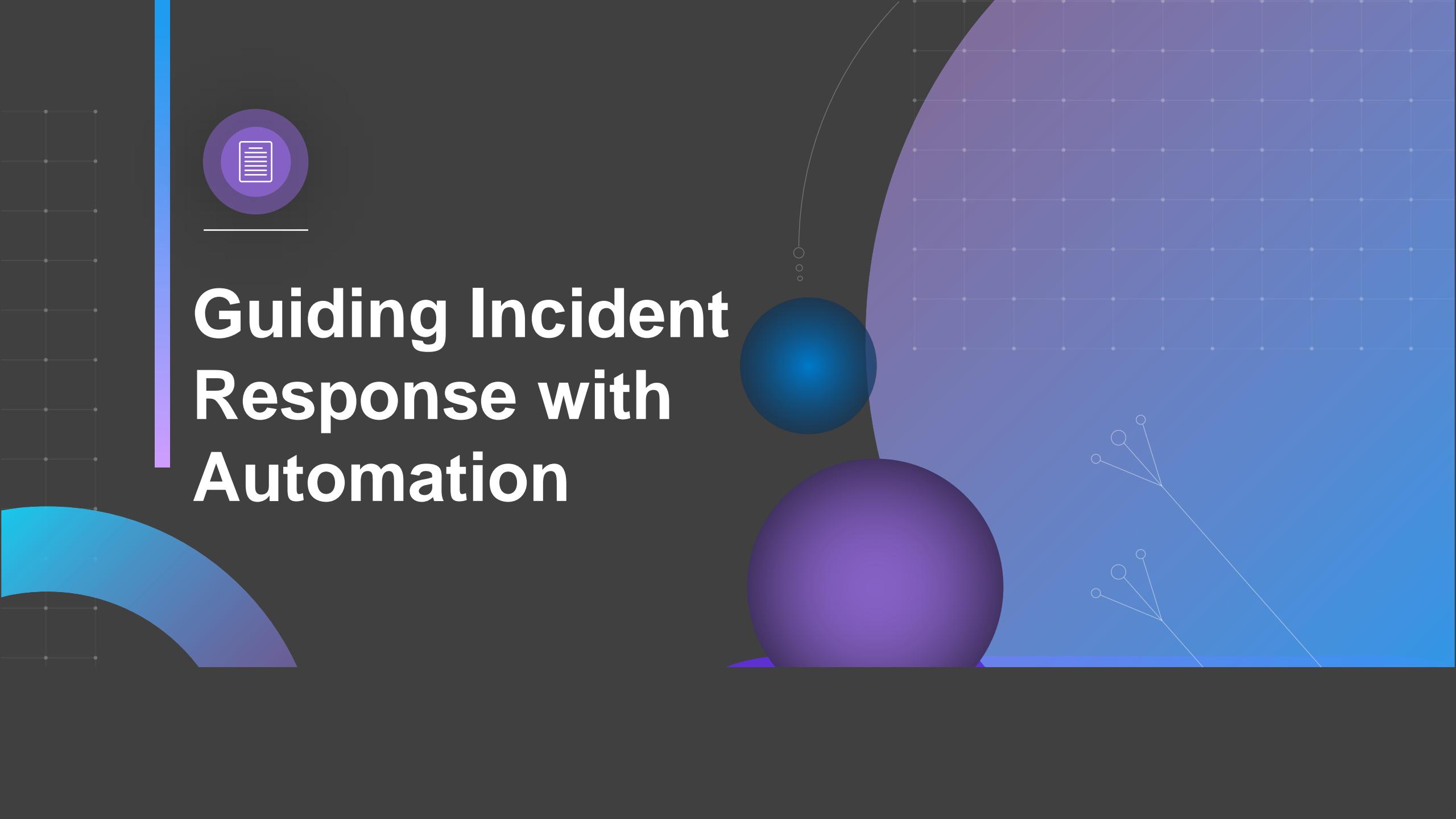


Actionable



In need of
human intervention





Guiding Incident Response with Automation



The Value of Automation

“

Can't see the value of automation?!! At some point it's an IQ test.

– **Jeffrey Snover**

*Technical Fellow and
Creator of PowerShell
2010*



Reducing Manual Intervention in Production



Move manual, repetitive tasks to automation



Reduce human interaction to reduce variability in response



Protect production by ensuring notification and response

Demo



Creating a Basic DRI Notification

The Value of Automation



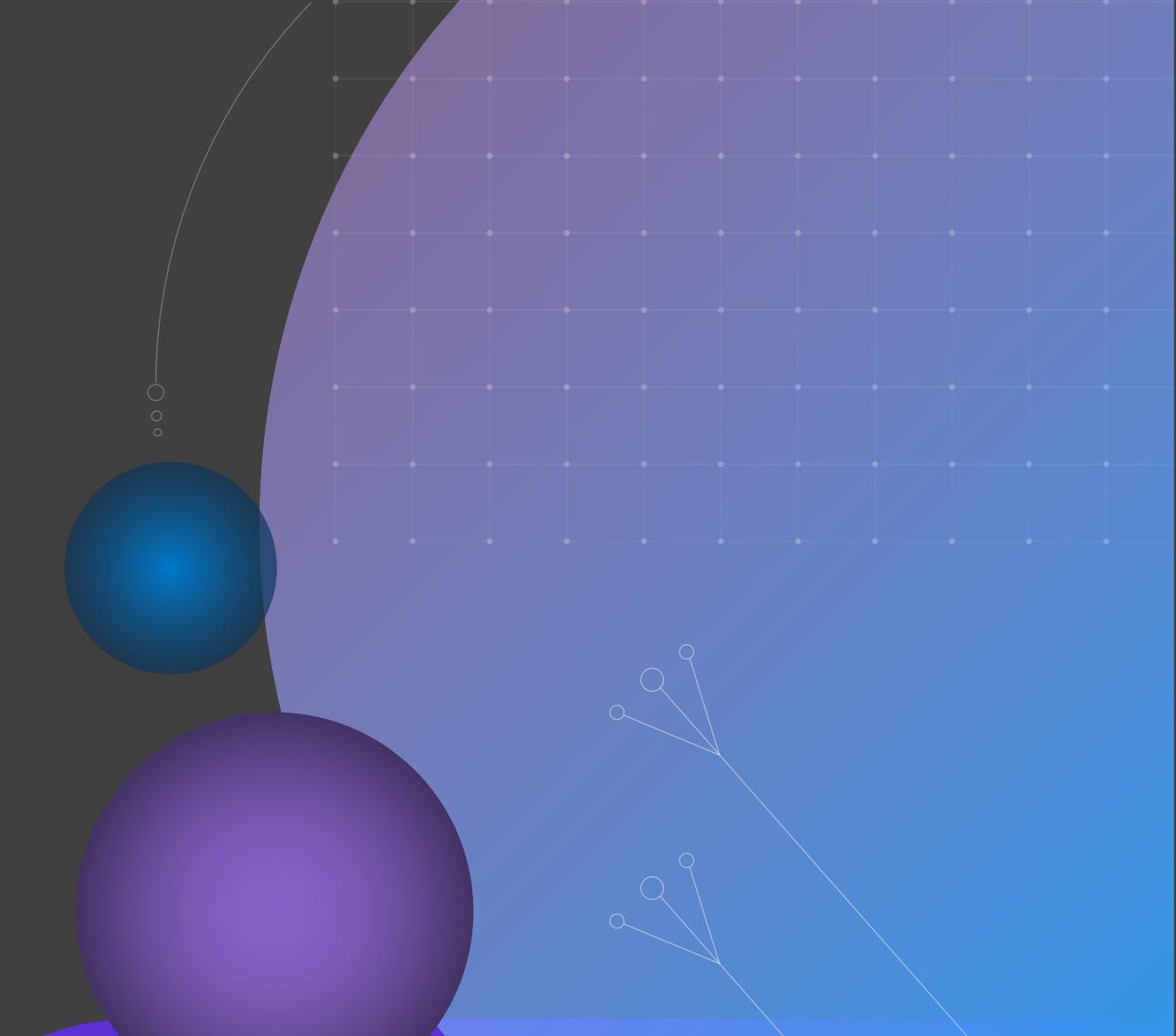
*In a lousy economy, NOTHING
is more important than
automation.*

Productivity == Career security.

– **Jeffrey Snover**
*Technical Fellow and
Creator of PowerShell*
2009



Review



Review

Monitor to Understand Production

Improve time to detect, mitigate, and remediate, and enable validated learning.

Responsible Incident Response

If everyone is responsible for incident response, no one is.

Automation Guided Response

Let machines do repetitive tasks and help guide the response process.