

Modern Release Patterns and Practices

AgileIndy

March 13, 2019



Agenda

Introduction

What is
DevOps?

Kaya Records –
Problem
Domain

Drive Toward
Excellence

Conclusion

Introduction



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Introduction

What This Is

- Brief introduction to DevOps at a high level
- Presentation of fictitious company in need of DevOps help
- Presentation of battle-tested modern release patterns and practices

What This Is NOT

- A full DevOps 101
- A silver bullet

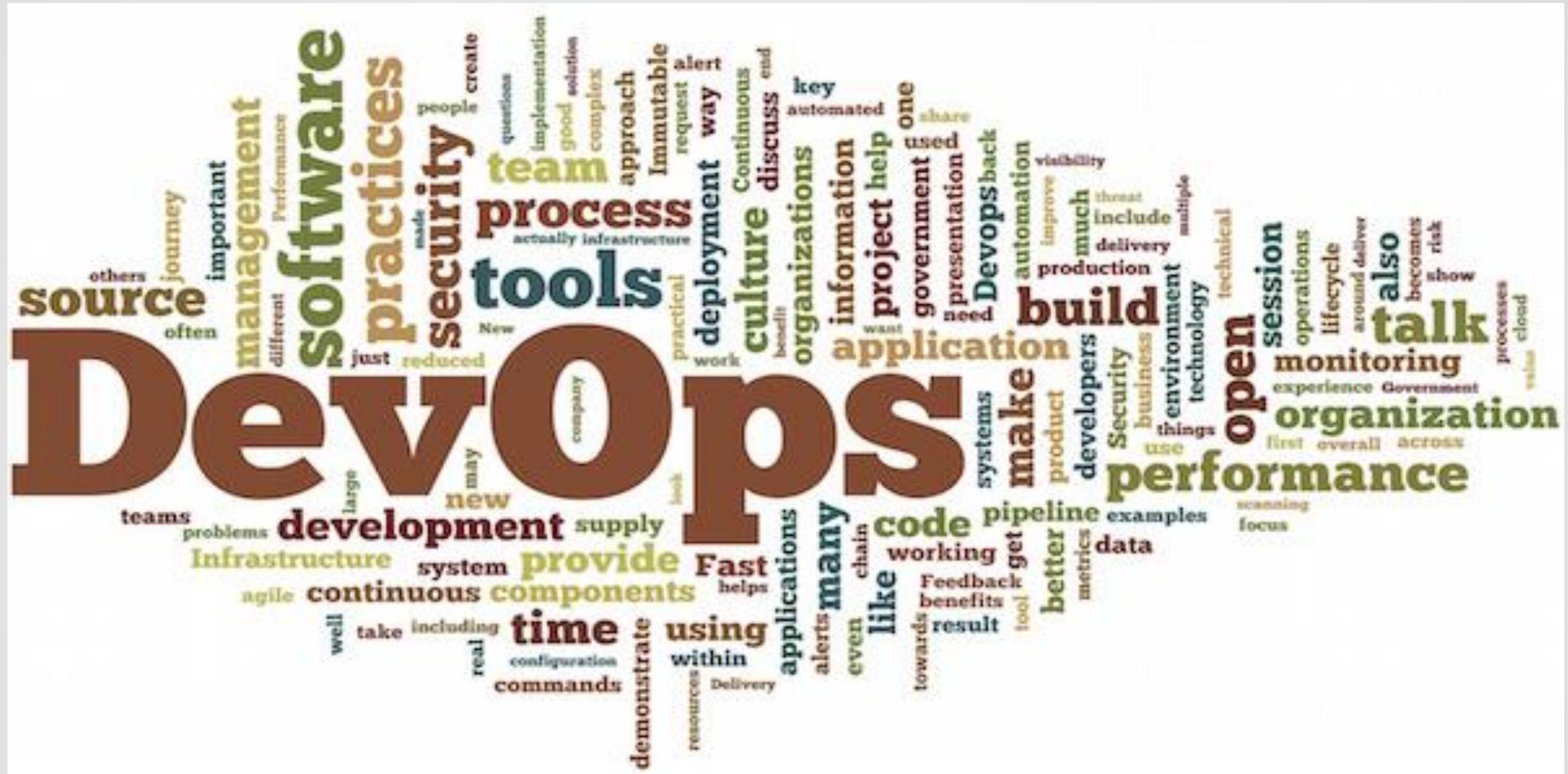
Why Listen to Me?

- West Point graduate
- Led 50+ teams, sized from 3 to 150+
- DevOps Coach
- Multiple DevOps transformations at household name clients
- “Honest broker”

A photograph of a young man with brown hair, wearing a light blue button-down shirt and blue jeans, sitting on a bench outdoors. He is smiling and looking towards the camera. The background shows a city street with buildings, a red awning, and a woman walking away. A large red rectangular overlay covers the right side of the image. Inside the overlay, the text "What is DevOps?" is displayed in a white, sans-serif font.

What is DevOps?

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DevOps is a Transformation

People

Culture

Training

Expert Help

Process

Workflow

Automation

Tools

SCM/VCS

Pipelines

Testing

Config

Etc...

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Collaborate

Application Lifecycle Mgmt.



Communication & ChatOps



Knowledge Sharing



Build

SCM/VCS



CI



Build



Database Management



Test

Testing



Deploy

Deployment



Config Mgmt./Provisioning



Artefact Management



Run

Cloud / IaaS / PaaS



Orchestration & Scheduling



BI / Monitoring / Logging



Leadership

People

Culture

Training

Expert Help

Process

Workflow

Automation

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SCM/VCS

Pipelines

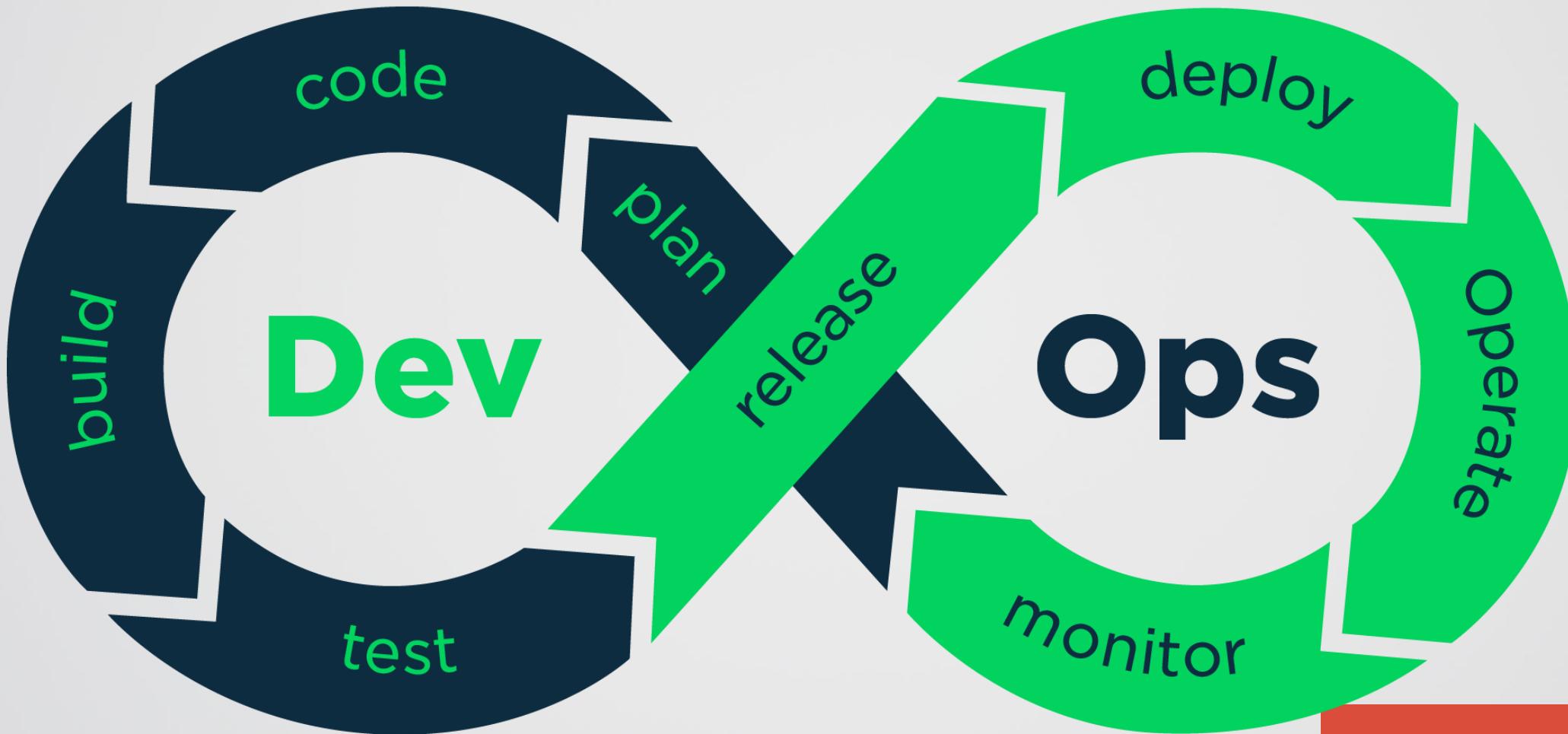
Testing

Config

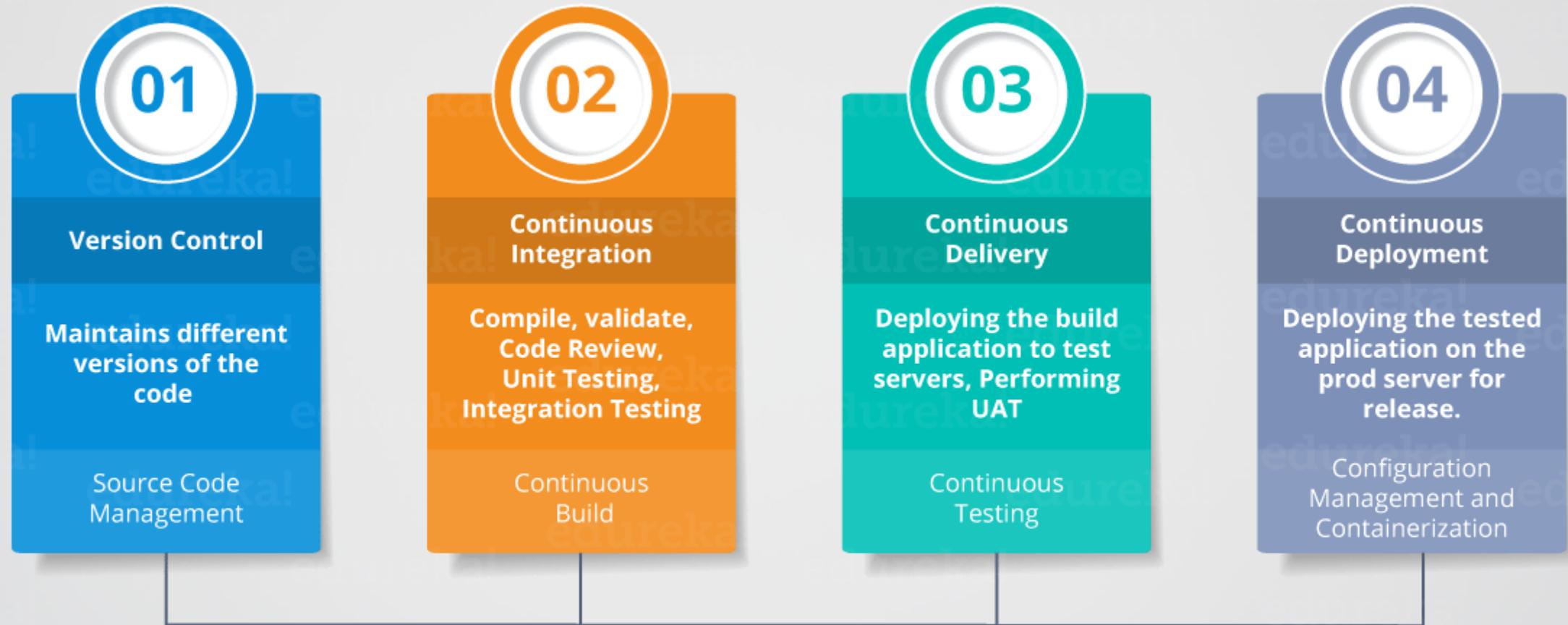
Etc...

Communication

The Infinity Loop



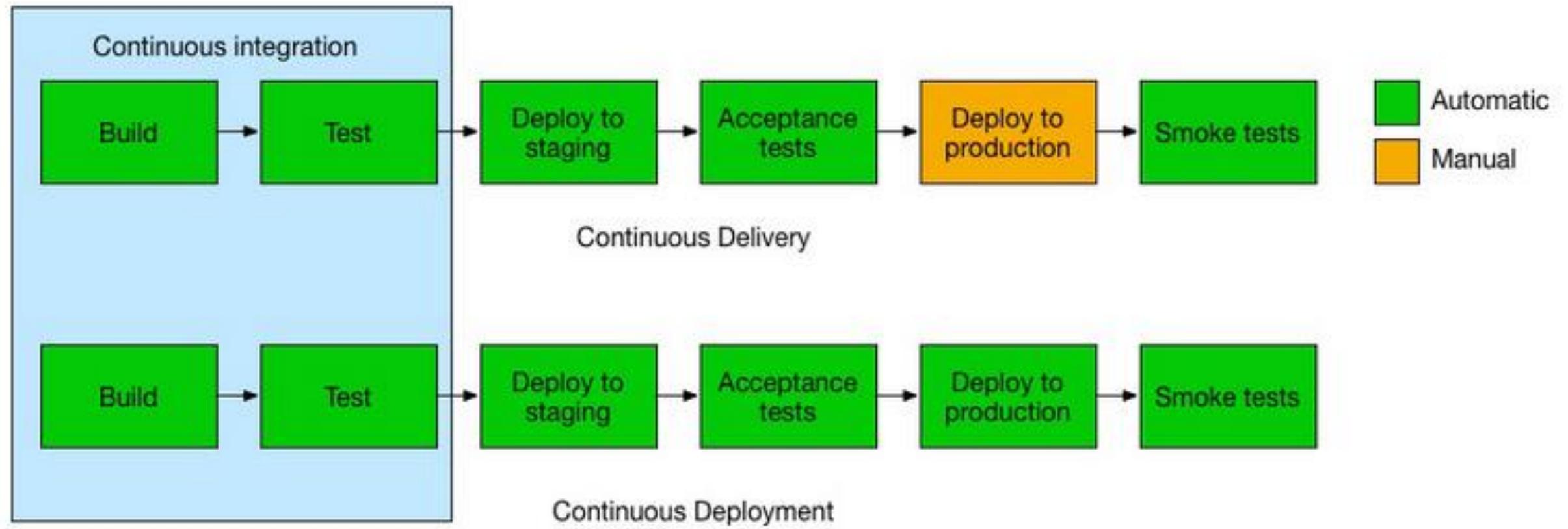
CI / CD / CD



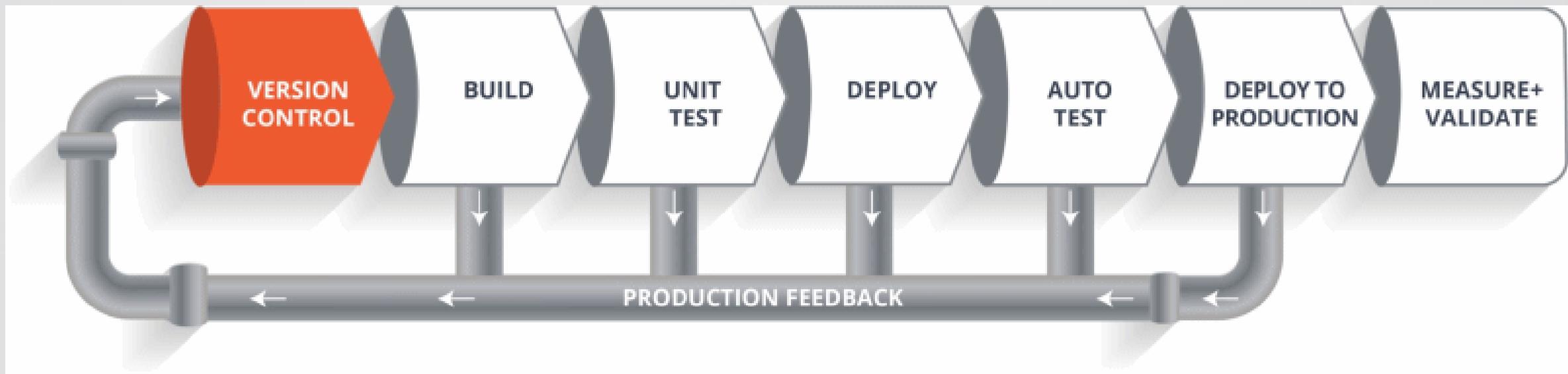
edureka!

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CI / CD / CD



Pipelines



Kaya Records



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Problem Domain

Driving Forces

- Digital Transformation
- Digital Disruption
- Time-to-Market
- Cost optimization

Cloud Solution

- Low cost of entry
- Fast innovation

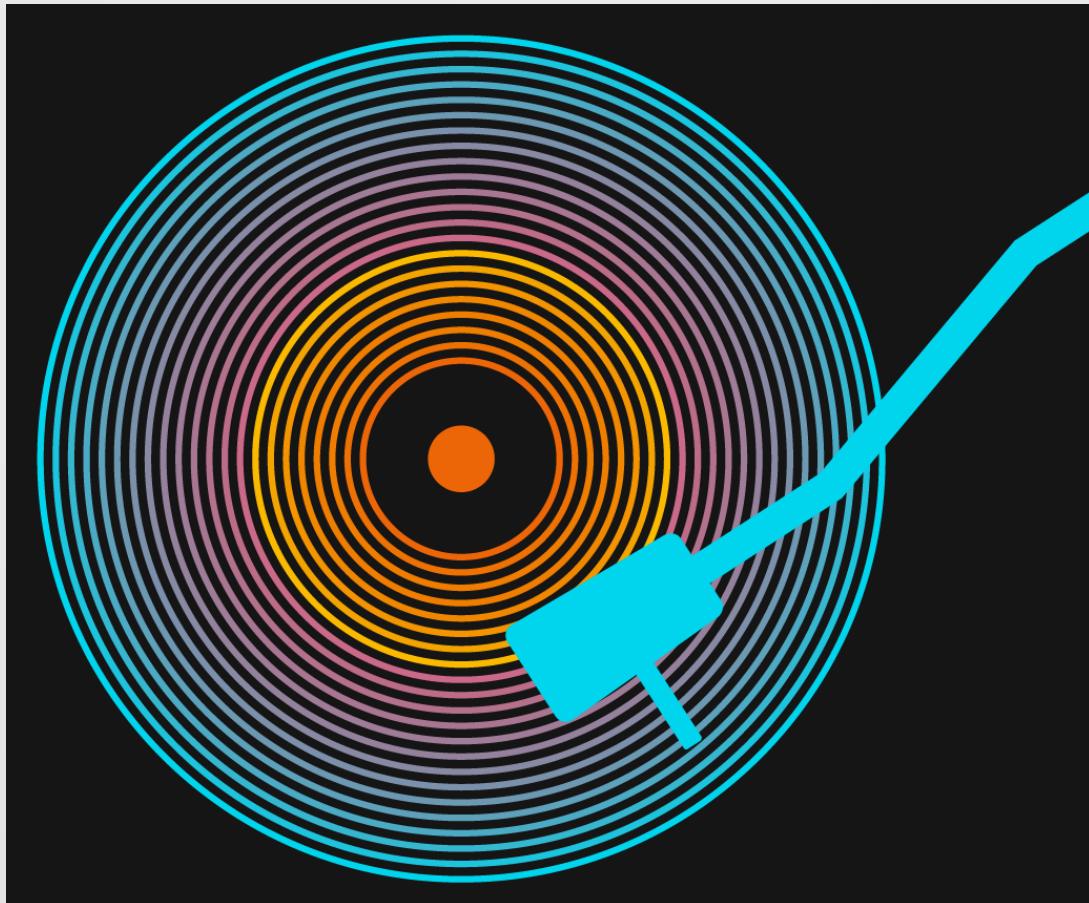
Problem Domain

Want to move from a focus on RESOURCE OPTIMIZATION to a focus on TIME TO MARKET

- 99% of all organizations are optimized on resources, better known as PEOPLE
- Everyone that does the same thing is on the same team
 - People are interchangeable
 - Well defined process drives delivery to ensure predictability
 - Hierarchical, top-down environment with very little empowerment
 - Departments are silos
 - Multi-skill “collaboration” requires tickets and approvals
- Future State: Multi-functional team
 - Automation drives predictability
 - Self-organizing teams
 - Silos are knocked down
 - Collaboration is through Agile and DevOps concepts

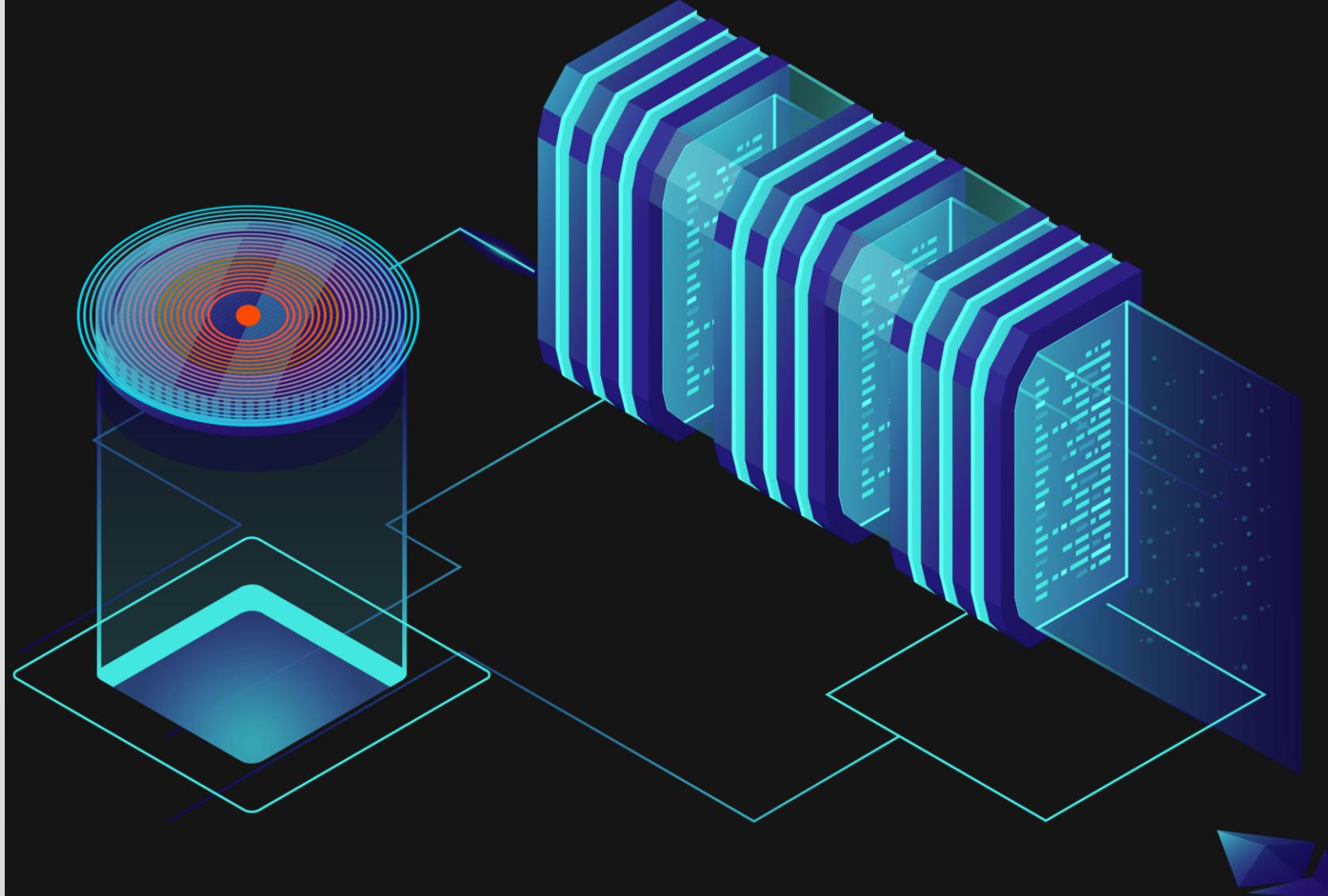
Introducing Kaya Records

Music Store Company / Sells Vinyl Records
Has an Online Shop / Needs to Compete Now



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Issues

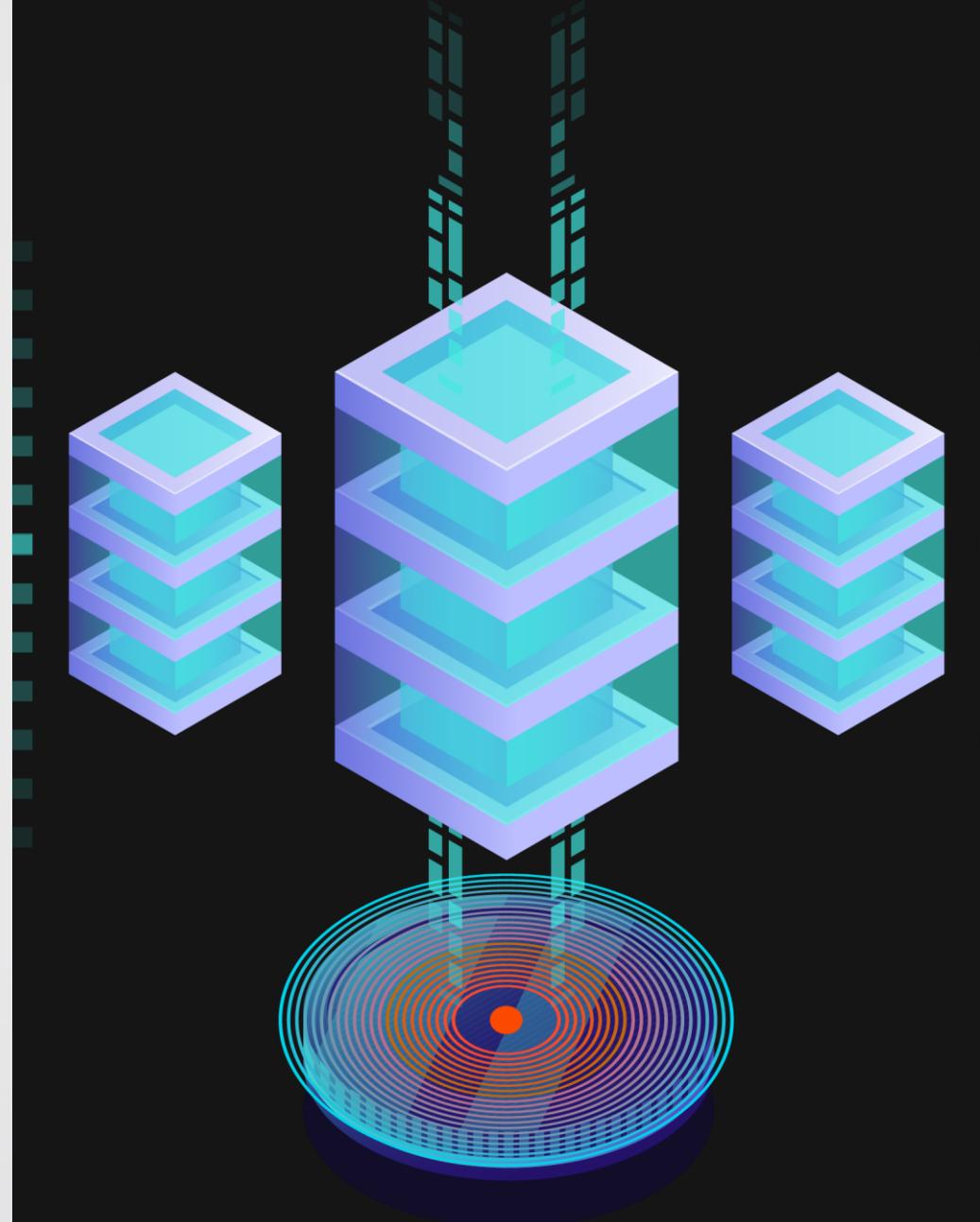


New Investment
Needed in Data
Center

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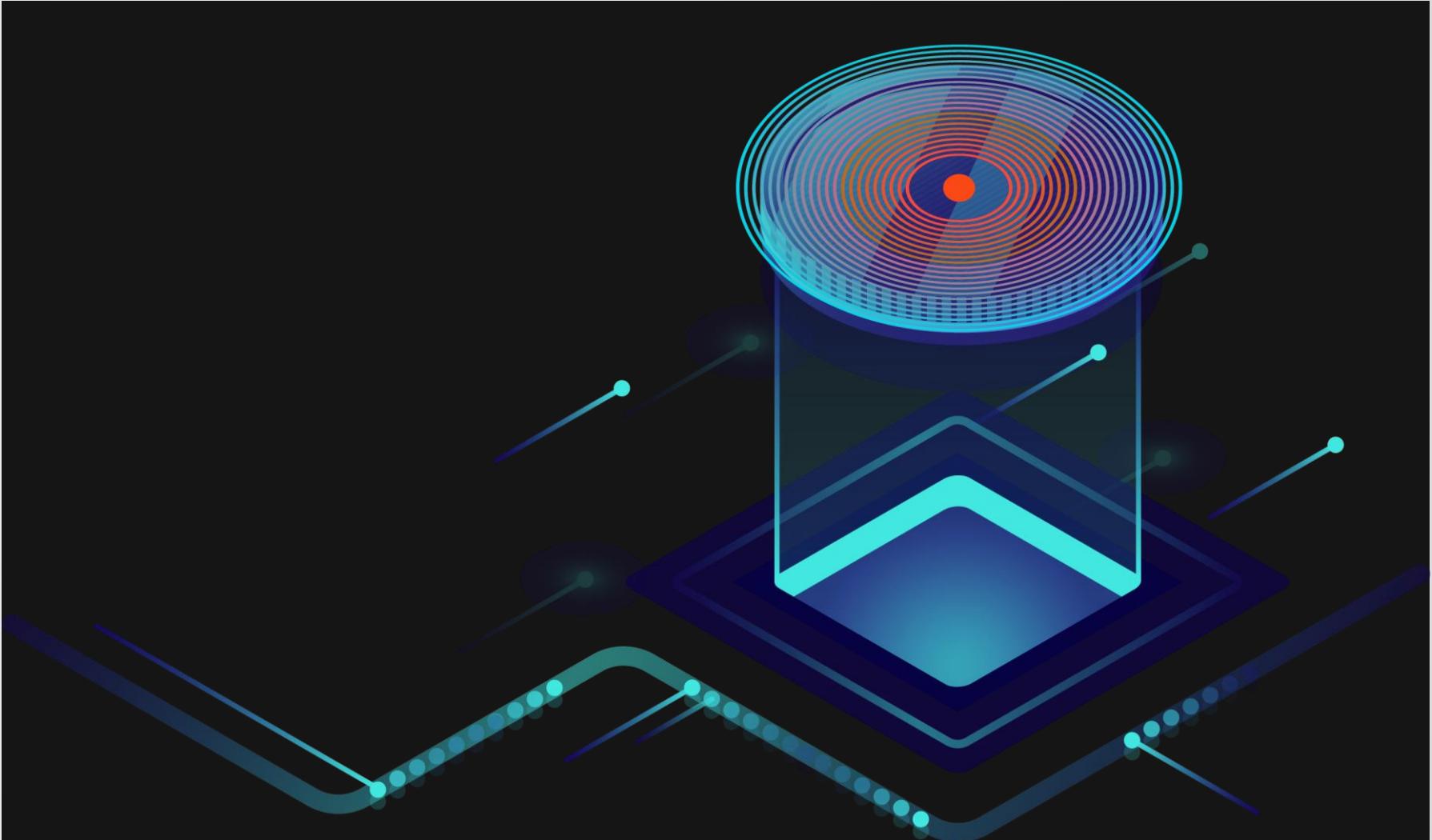
Issues

Hard to Make
Changes to the
Current Application



Issues

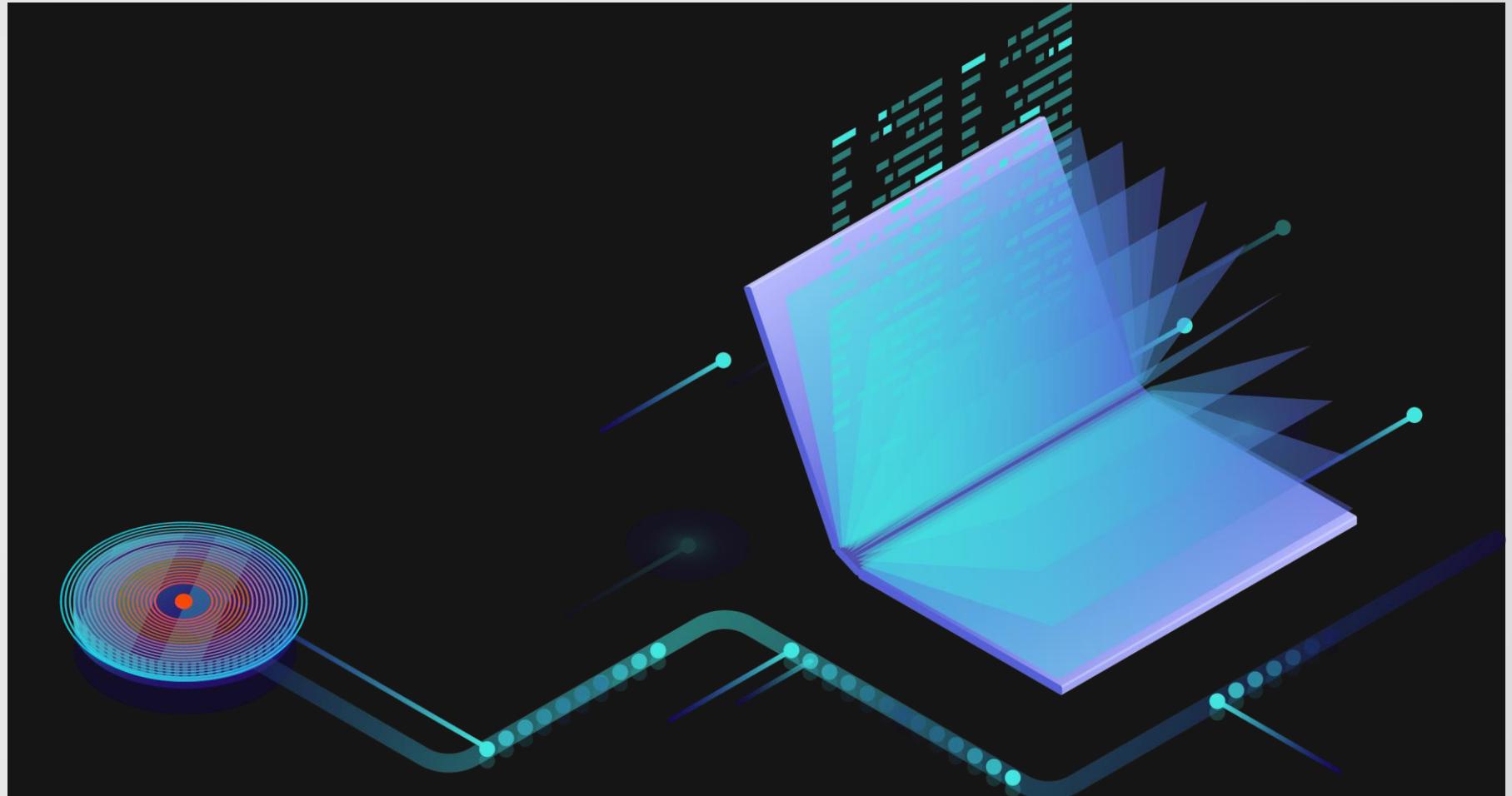
Any Significant
Change (Release)
Requires Downtime



Issues

Hard to compete
– need to change
the business
model

- Sell other products
- Subscription services
- ???



Issues

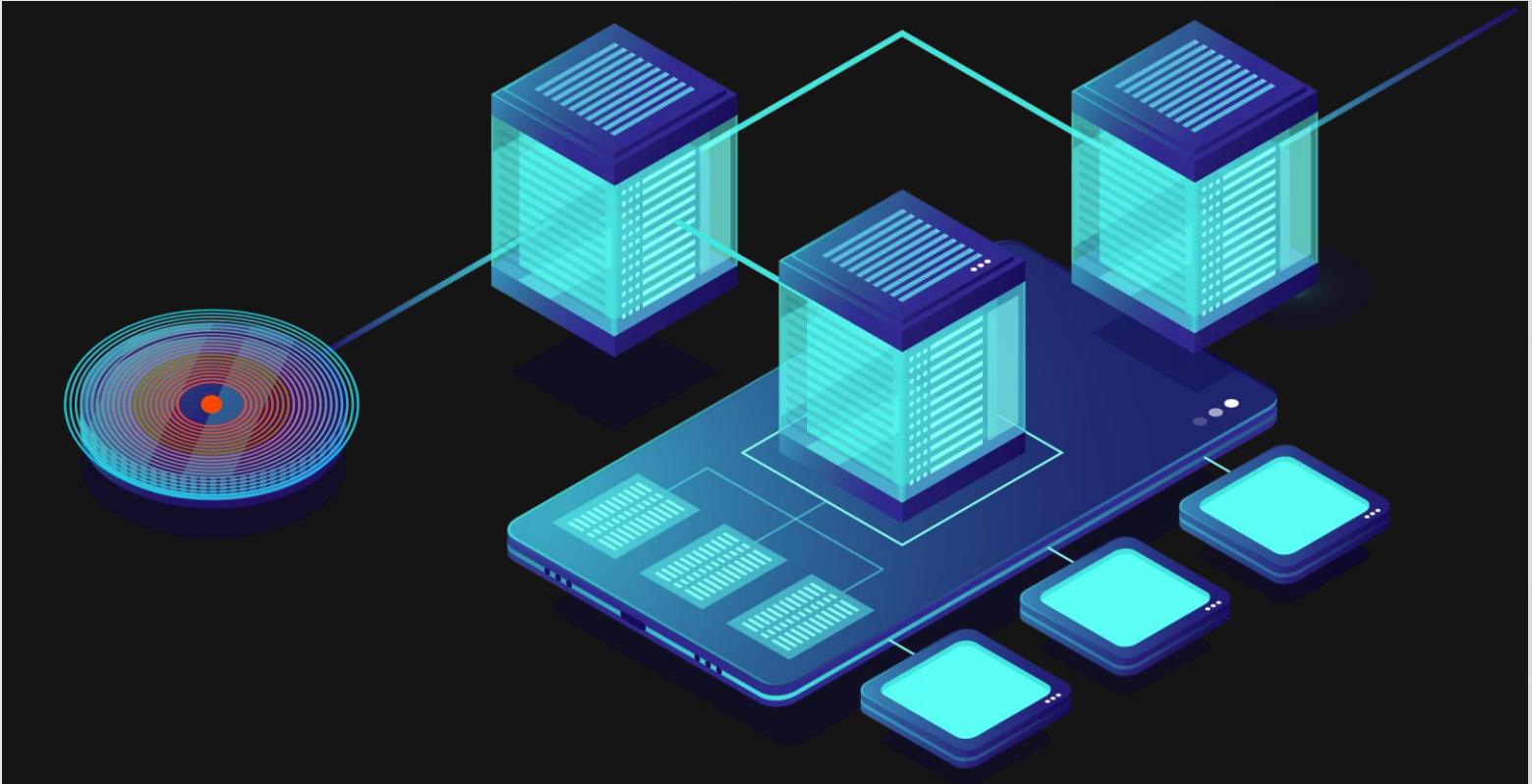
Customer Feedback
– Online Shop is
Slow and Outdated
-Need a complete overhaul of
the online system



Strategy

Move to a DevOps Mindset

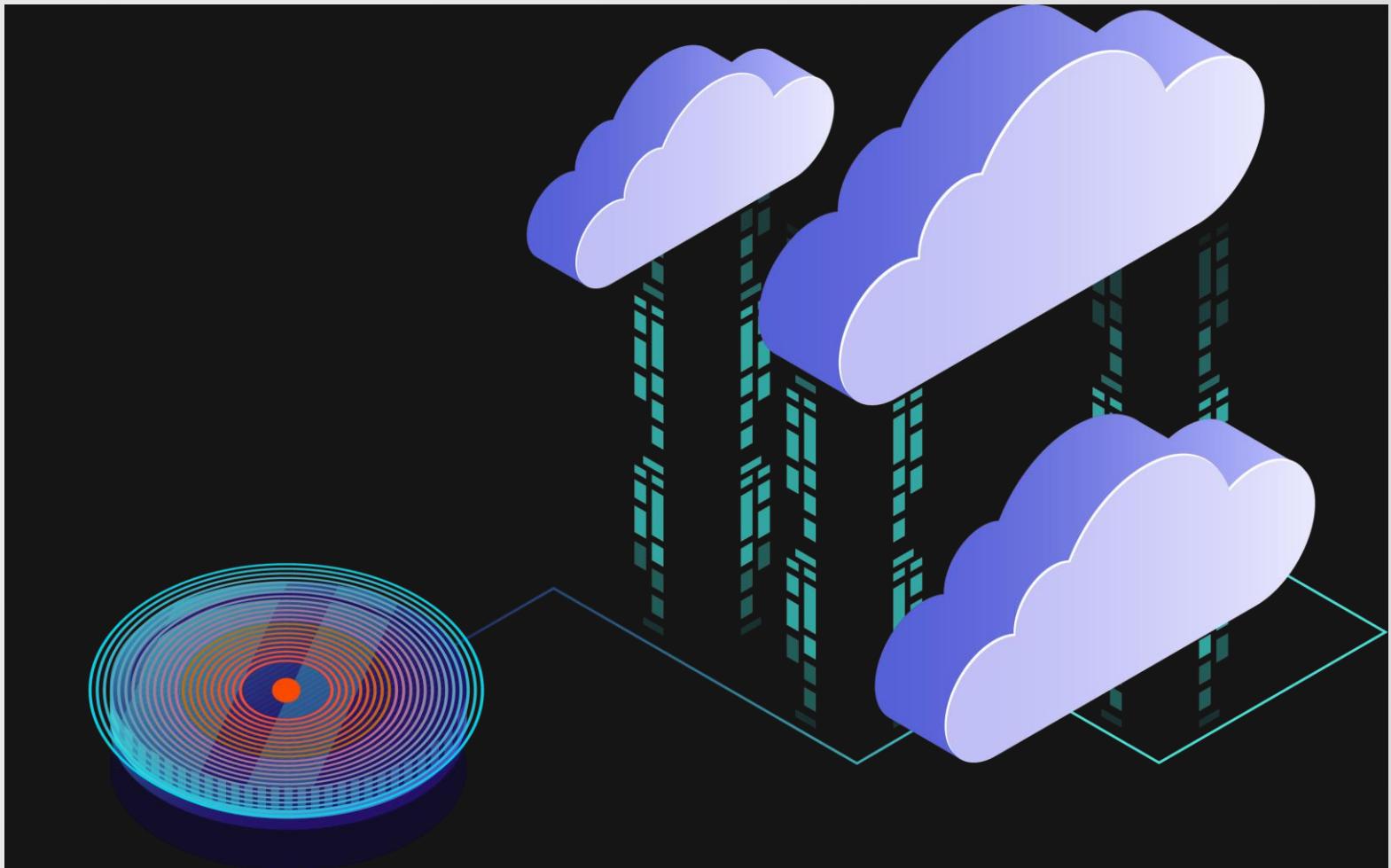
- Customer-centric approach to software
- Highest priority is Time to Market
- Flexibility and power to satisfy customers **FAST**



Strategy

Move From On-Prem to the Cloud

- Use cloud as a transformation accelerator



Strategy

DevOps Transformation
Requires a
Combination of:

- People
- Process
- Tools
- Leadership
- Communication





Drive Toward
Excellence

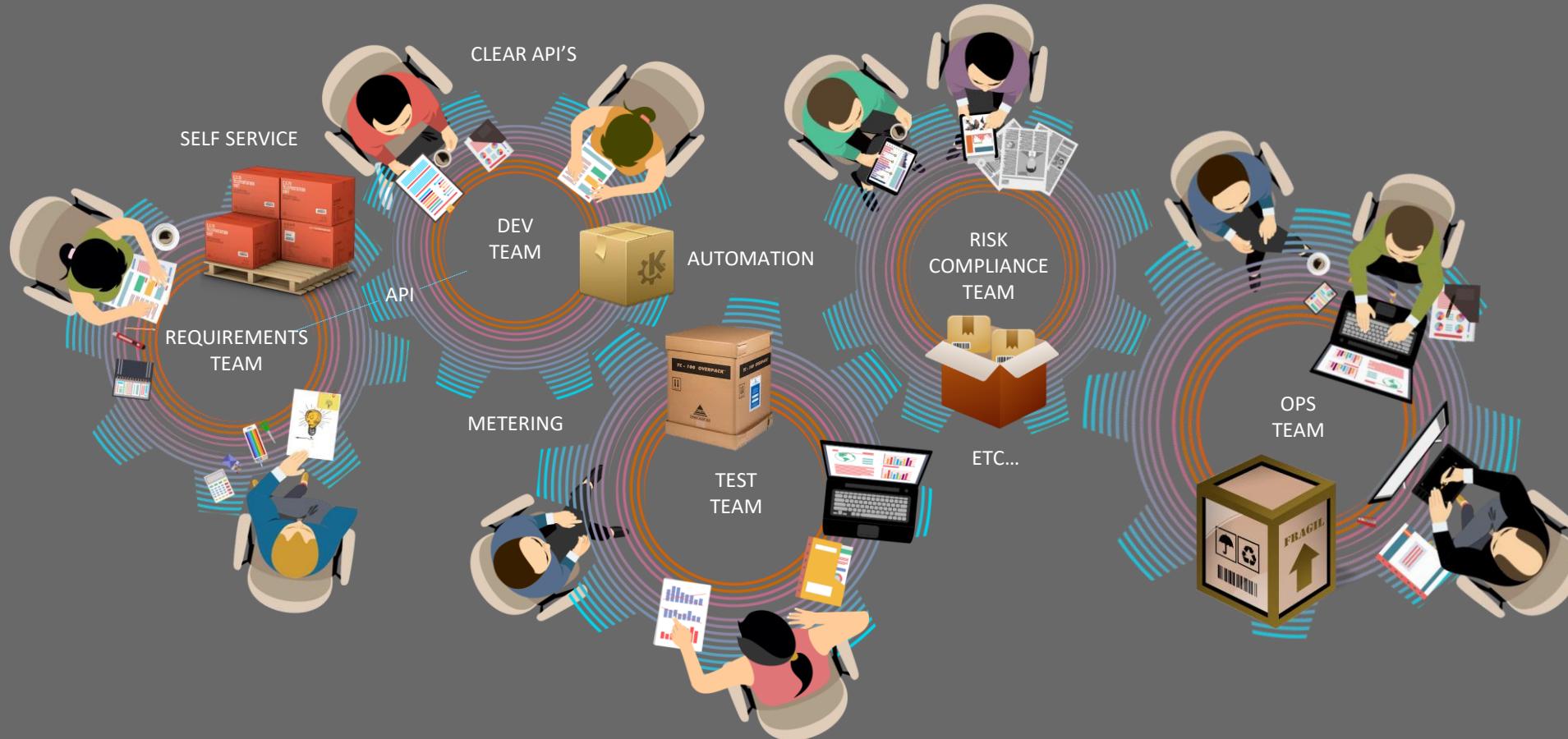
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Optimize Value Delivery

- Step 1: Assess the current situation
- Step 2: Attack the biggest pain point or bottleneck
- Step 3: Repeat Steps 1 and 2

Mission #1: Organization and Flow

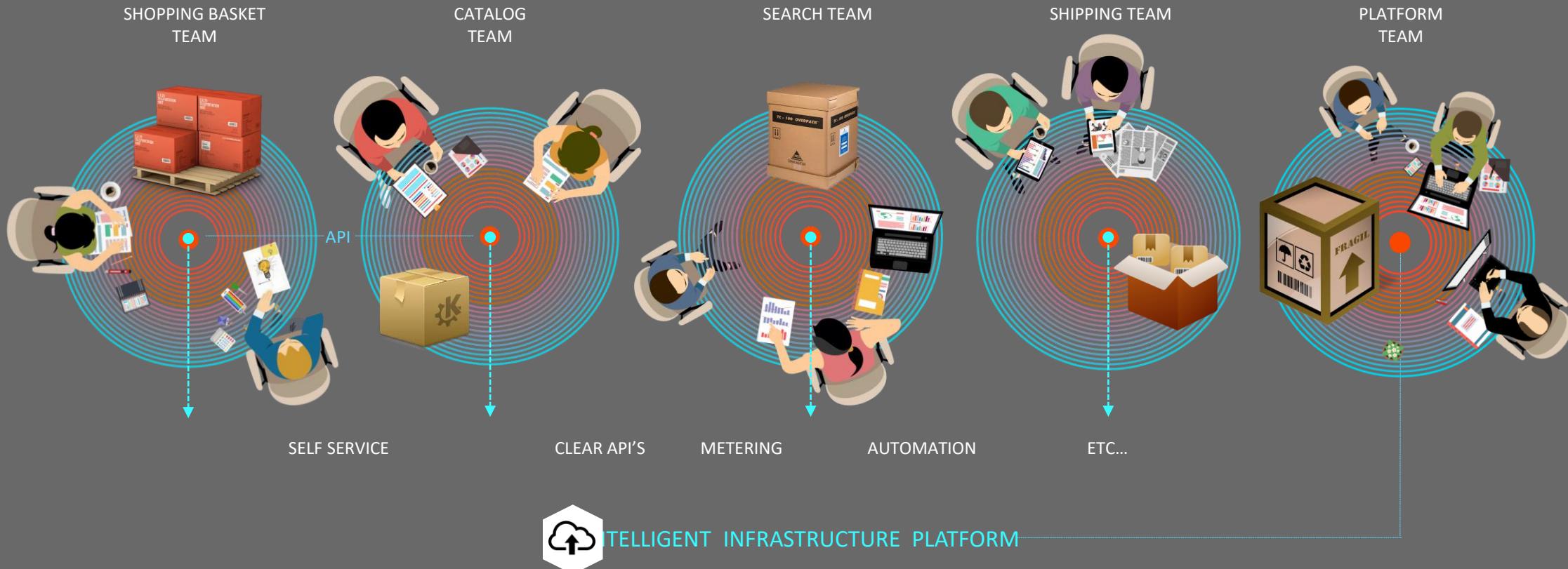
CURRENT ORGANIZATION



- SILOS
- COST DRIVEN
- SPECIFIC
- NO AUTONOMY
- RESPONSIBILITY
- PROJECT TEAMS

Mission #1: Organization and Flow

ORGANIZATIONAL CHANGES TO GET TO DEVOPS



- MISSION COMMAND VALUE DRIVEN
- END TO END AUTONOMOUS
- CROSS-FUNCTIONAL PRODUCT TEAMS

Mission #2: Data Center and Agility

- Inertia of IT Ops in Current Data Center
- High Level of Governance
- Physical Servers
- Minimal Agility
 - CAPEX process for scale out
 - Backyard mechanic process for scale up
 - Downtime for every release

Mission #2: Data Center and Agility

Solution: Move to Public Cloud

- Model Change from CAPEX to OPEX
- Flexibility for Scale Up and Out
- Zero Downtime
- Retooling for Cloud
- Step 1: Move Existing Web Site to the Cloud

Mission #3: Tooling and Automation

- Automation, Automation, Automations
 - Automate as much as you can
 - Automate as early as you can
- Need for Repeatable and Reliable Deployments
- Choose Microsoft Toolset
 - Azure
 - Azure DevOps
 - Azure Resource Manager (ARM) Templates
- CI – Every Commit Triggers a Full Build
- CD – On Every Build, to Azure

Assessment

Where are We?

- Value Stream Based Teams
- Fully Automated Build
- Fully Automated Deployment to Azure App Services for Lower Environments

What Is Next?

- Improve Developer Flow for Stable Deployments
- Introduce Feature Toggles

Mission #4: Feature Toggles

- Culture of Experimentation – GOOD
- Unfinished or Untested Code is Making it Into Production
- This Results in Live Site Incidents (LSIs) - BAD
- Rollback Process is Slow and High-Touch

Mission #4: Feature Toggles

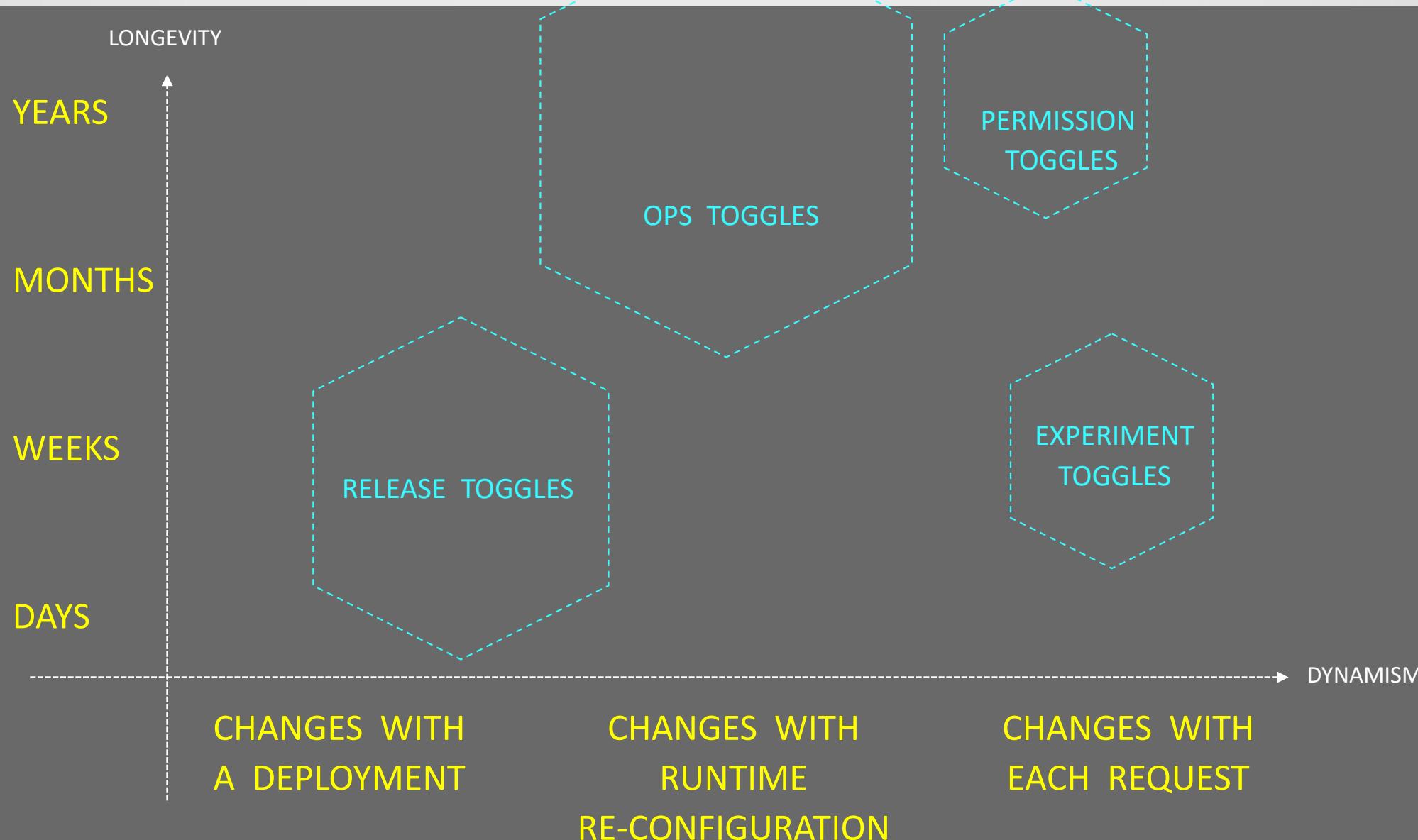
- When you want to ship often, how do you cope with code that is not finished or tested?
- Traditionally, you use feature branches to isolate
 - What if you want to ship weekly, or even daily? Feature branches will slow everything down.
- Solution 1: Break up changes into independent parts that can be released separately (current mission)
 - Use feature toggles/flags to enable or disable features
 - Give business control over who gets which feature
- Solution 2: Microservices (future)
- Solution 3: Slot deployments (future)

Mission #4: Feature Toggles

Do not build your own – there are many options already out there:

- If-Else
- Nfeature
- Feature Toggle
- Feature Switcher
- Flipit

Mission #4: Feature Toggles



Mission #4: Feature Toggles

Final points about Feature Toggles

- Feature Toggles need to be maintained!
- As soon as you do not need them, get rid of them
- If you keep them around, you produce Technical Debt

Assessment

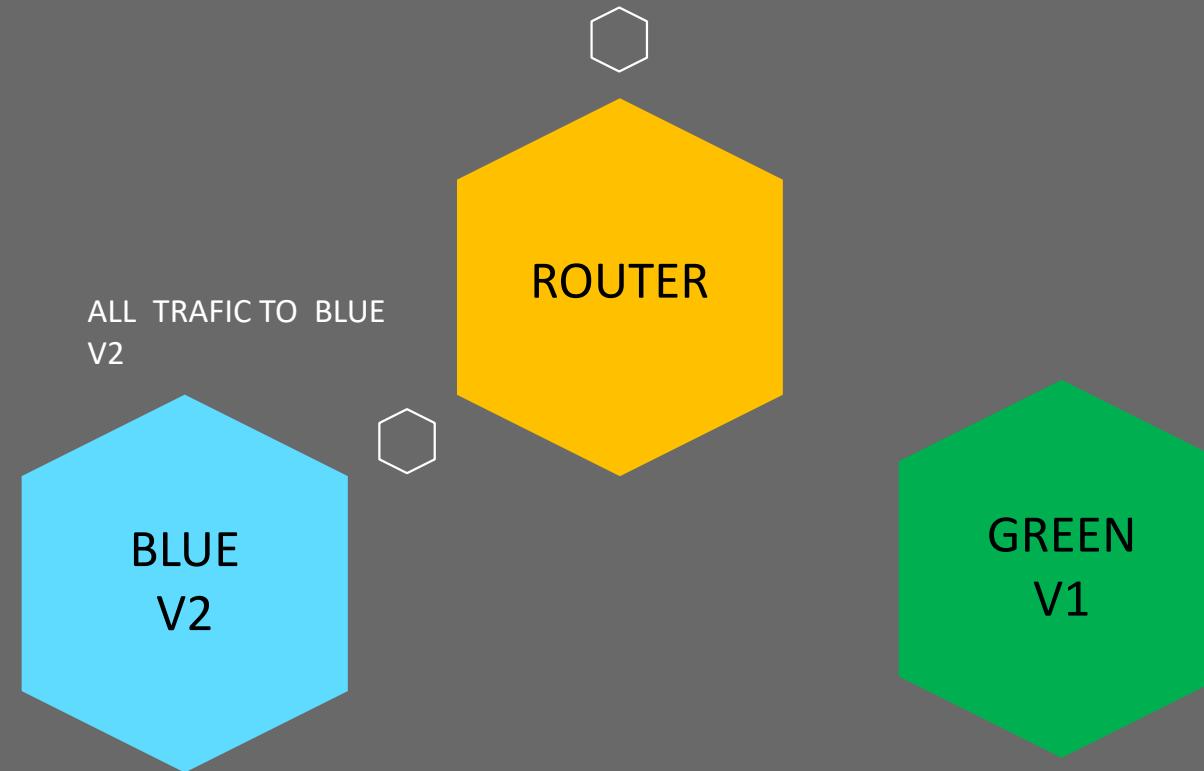
Where are We?

- Faster and More Stable Deployments
- Issue: There is still downtime at the moment of release

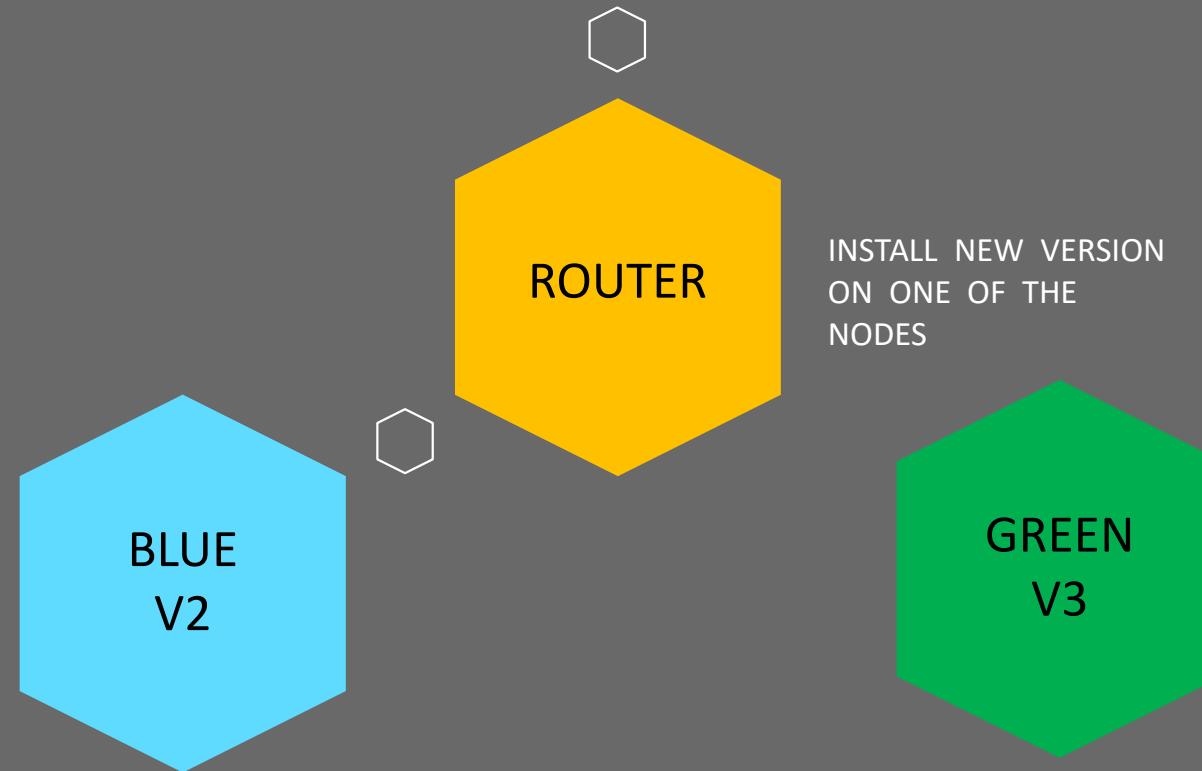
What Is Next?

- Blue/Green Deployments
 - Deploy to New Environment
 - When Deployment is Done, Slowly Move Traffic to New Environment
 - Eliminates Downtime
 - Improves Ability to Rollback

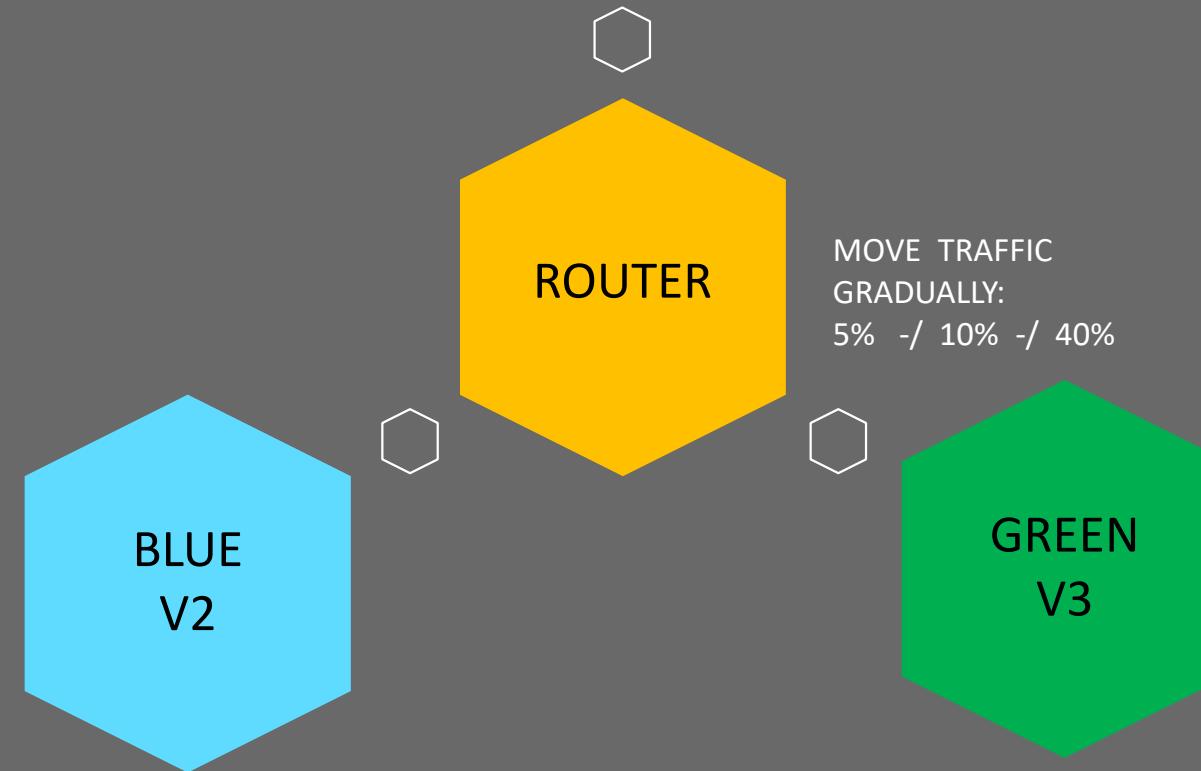
Mission #5: Blue/Green Deployments



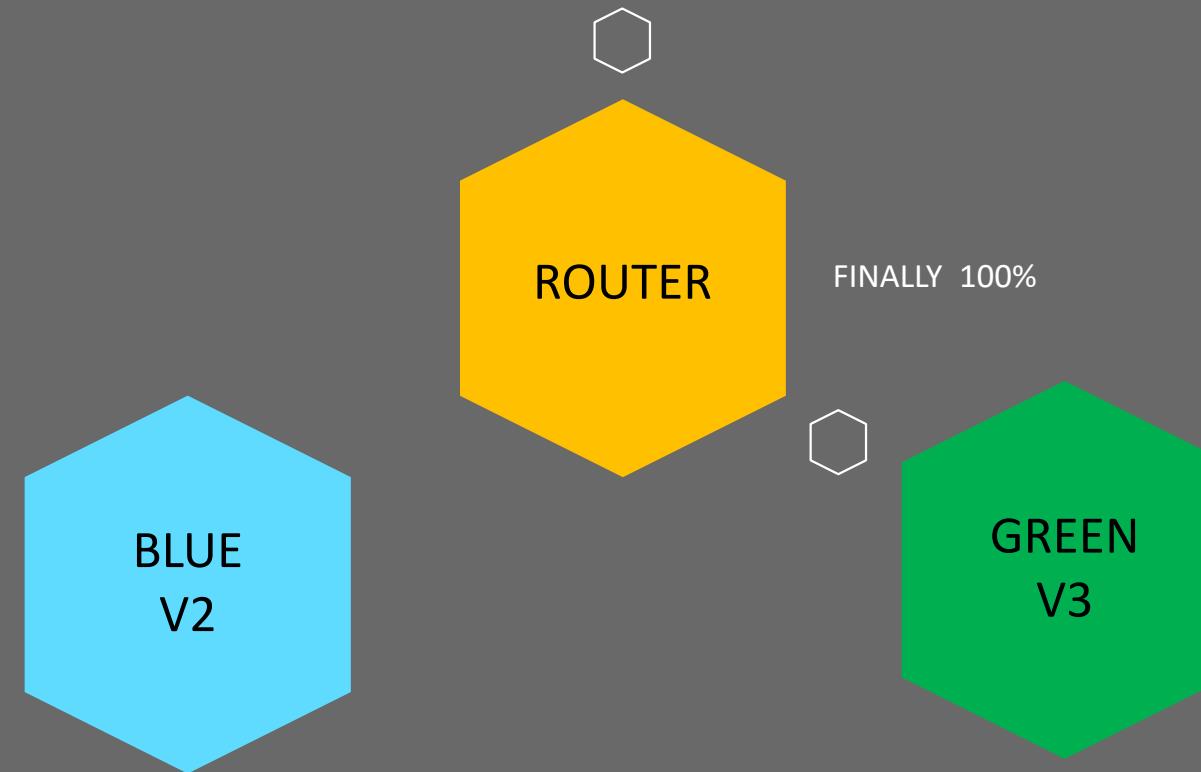
Mission #5: Blue/Green Deployments



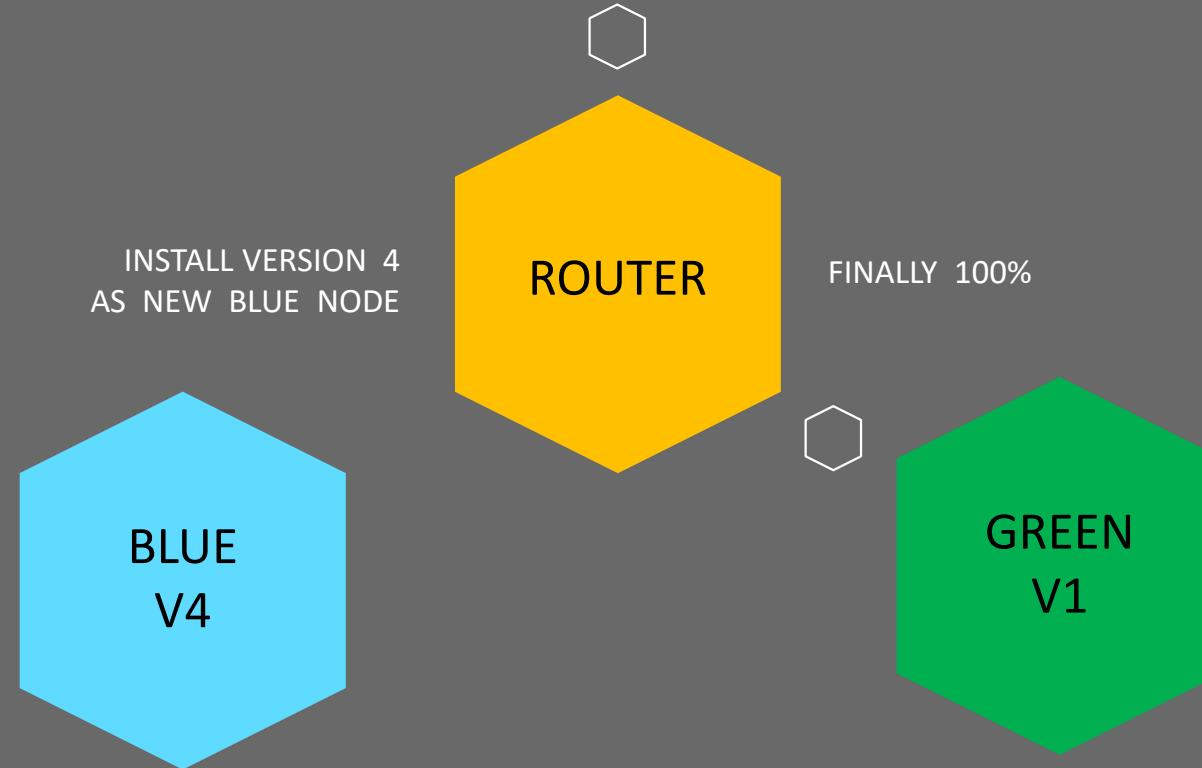
Mission #5: Blue/Green Deployments



Mission #5: Blue/Green Deployments



Mission #5: Blue/Green Deployments



Assessment

Where are We?

- Almost no downtime, except when we deploy database changes

What Is Next?

- Zero downtime deployment of the database

Mission #6: Zero Downtime Database Deploy

- Create binaries that are multi-schema compatible
- Deploy binaries
- Create change in DB
 - Ensure DDL statements don't block your queries or impact performance
- Create single schema – latest in code
- Deploy binaries
- Delete unused data

Mission #6: Zero Downtime Database Deploy

Step 1

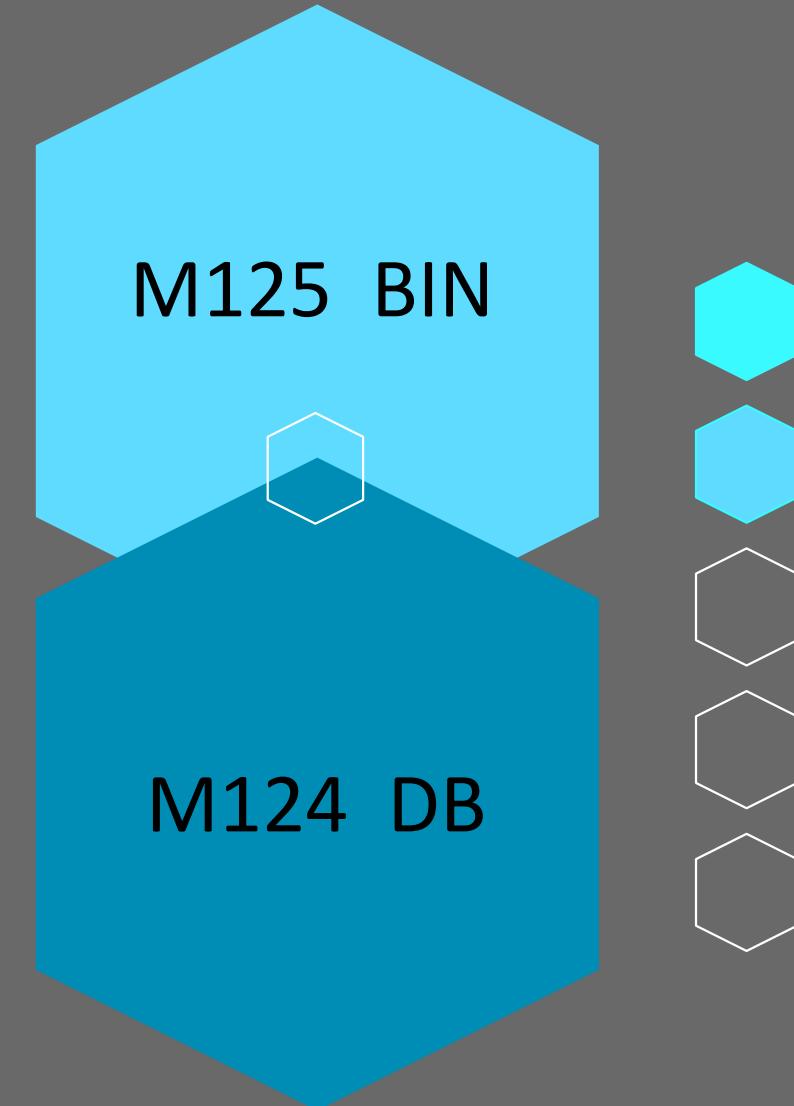
- Create binaries that are multi-schema compatible



Mission #6: Zero Downtime Database Deploy

Step 2

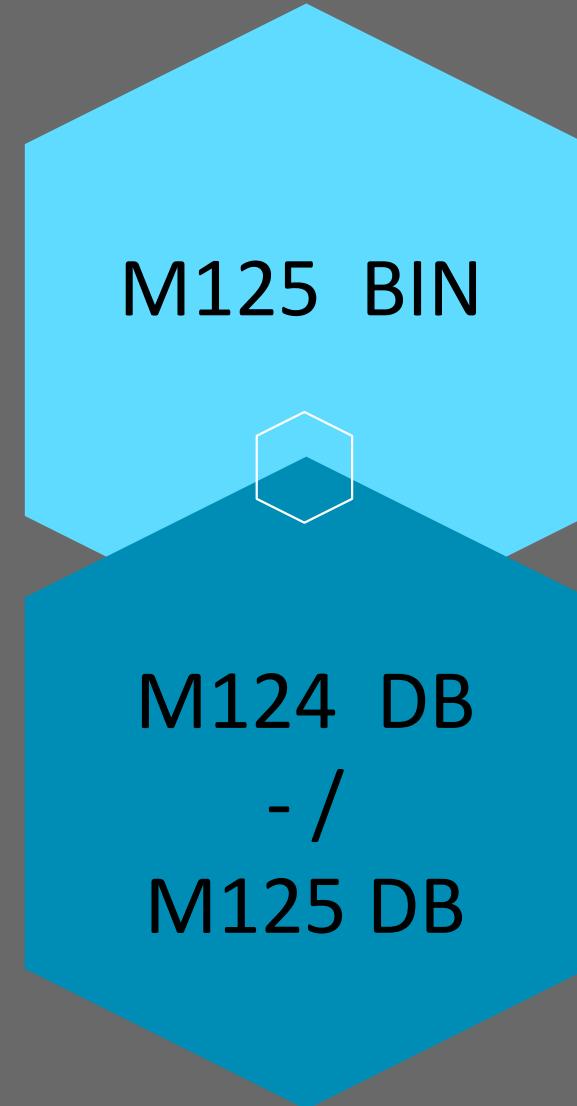
- Update the binaries to support new schema and old schema



Mission #6: Zero Downtime Database Deploy

Step 3

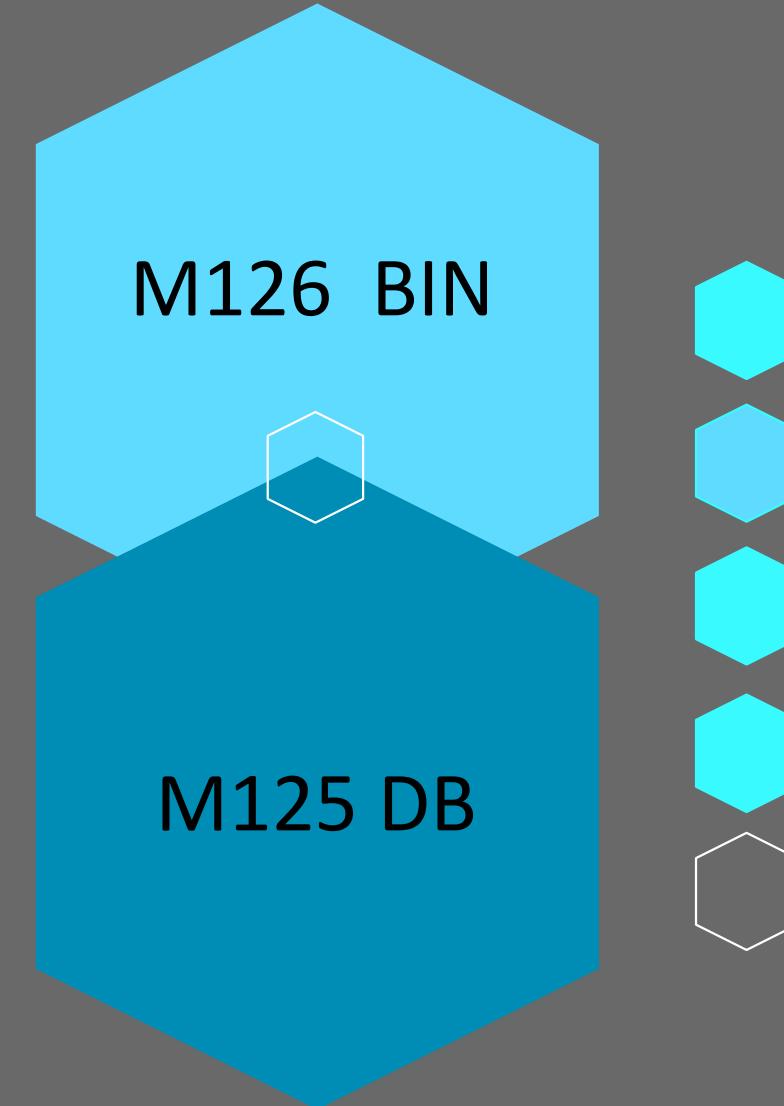
- Update the database with the new schema
- Migrate data slowly to new schema
- Don't UPDATE tables, always CREATE new
 - No table locks
 - Would create a read block on DB



Mission #6: Zero Downtime Database Deploy

Step 4

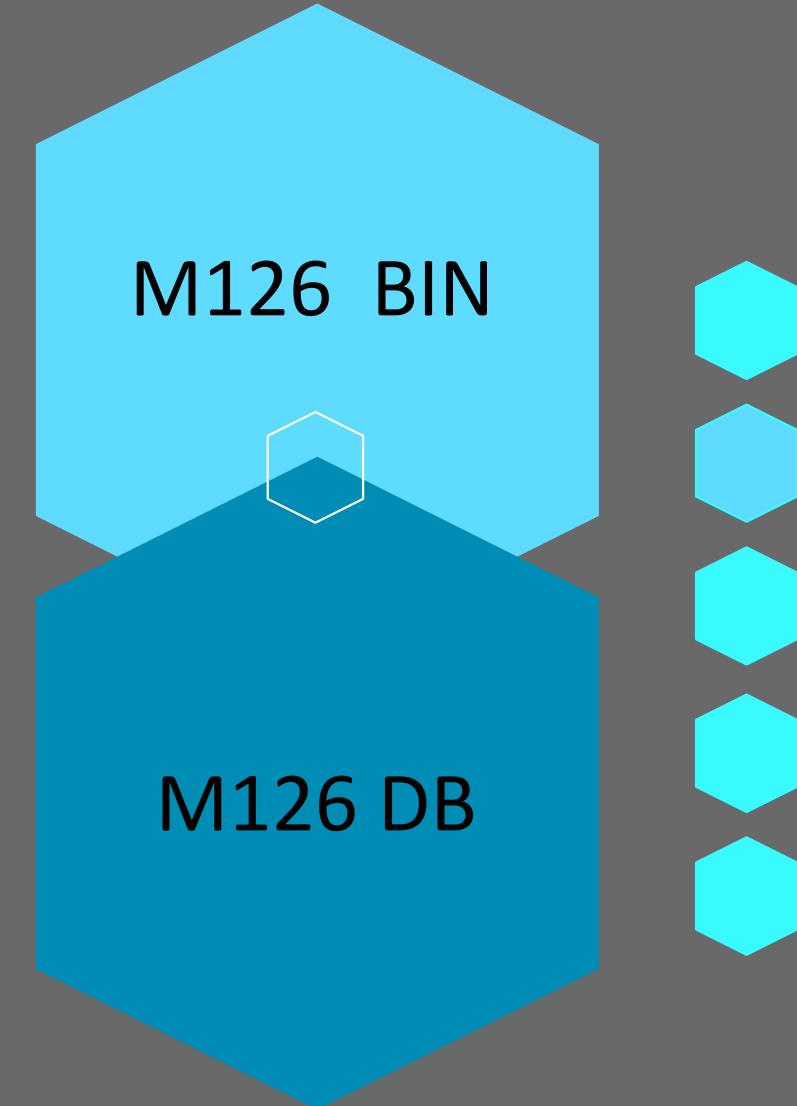
- Update binaries to use only new schema



Mission #6: Zero Downtime Database Deploy

Step 5

- Clean the old schema



Assessment

Where are We?

- Full automation
- Can release any time – multiple releases in one day!
- Zero downtime – including database changes

What is Next?

- Business wants more insights into features being used
 - Add telemetry

Mission #7: Add Telemetry to the System

Key Telemetry metrics to capture/report:

- Feature Usage
- System/Component Performance
- System/Component Availability
- Logs

Assessment

Where are We?

- Full automation
- Can release any time – multiple releases in one day!
- Zero downtime – including database changes
- We know which features are being used

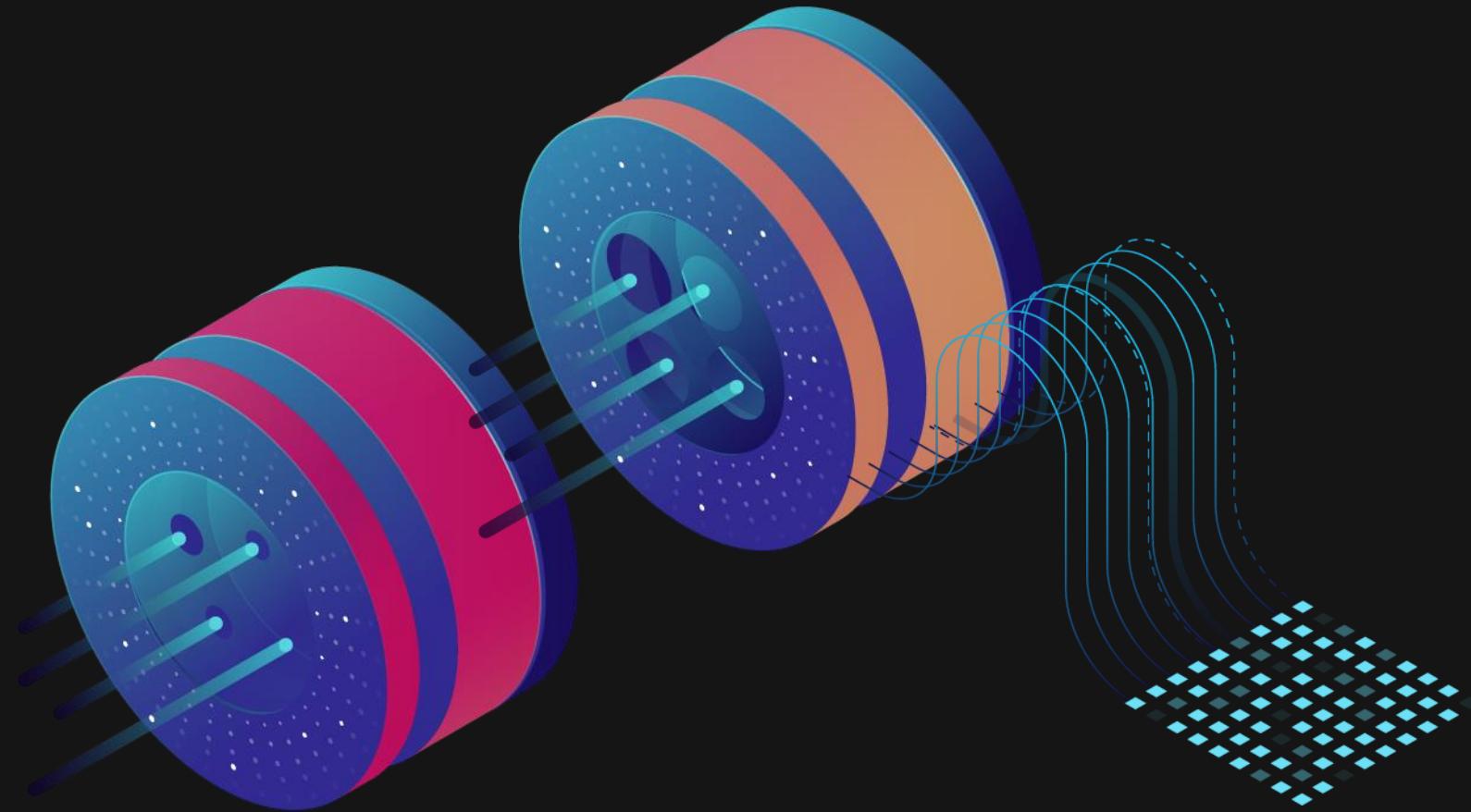
What is Next?

- Approvals are still a manual process
- Add release gates that use telemetry

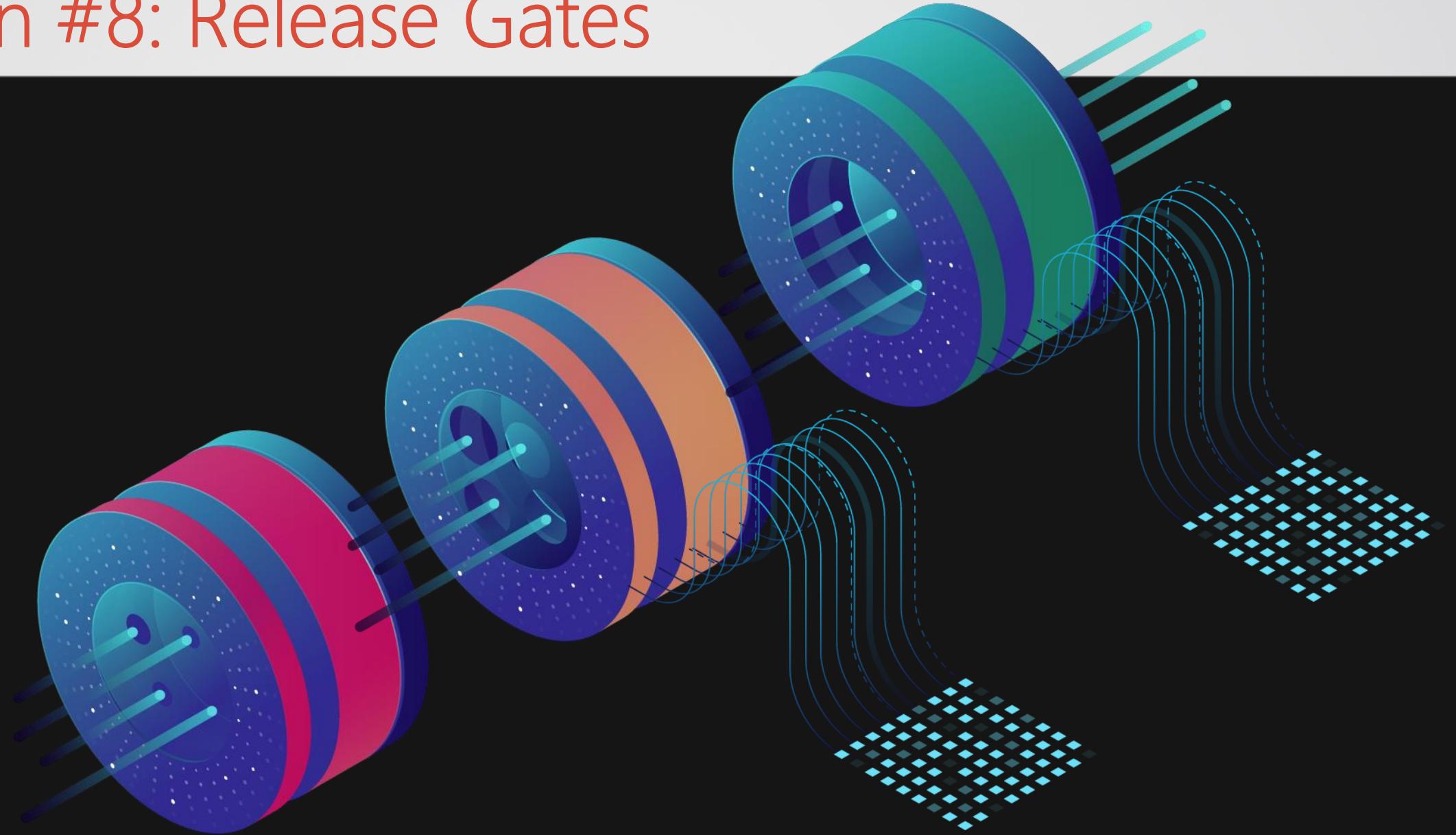
Mission #8: Release Gates



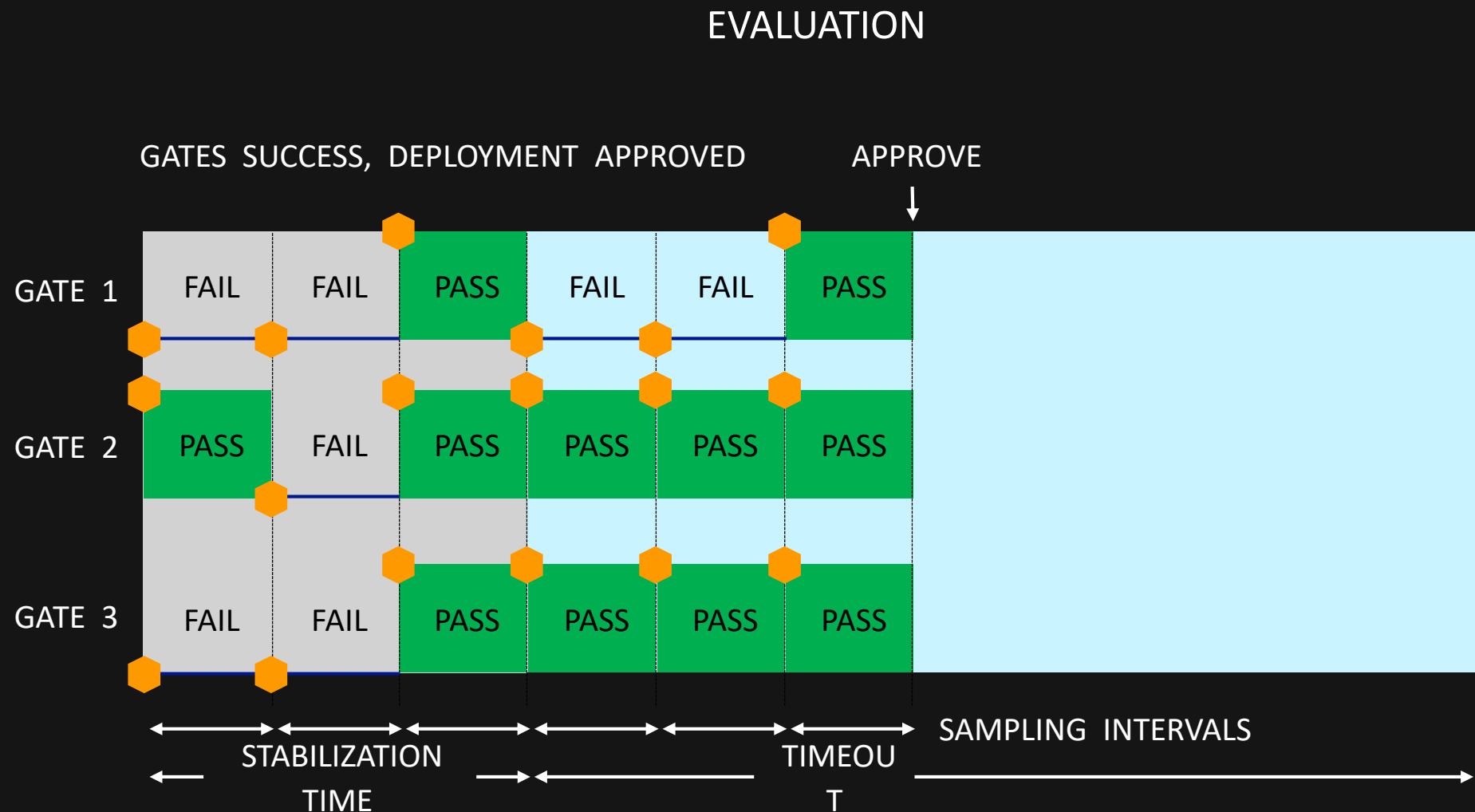
Mission #8: Release Gates



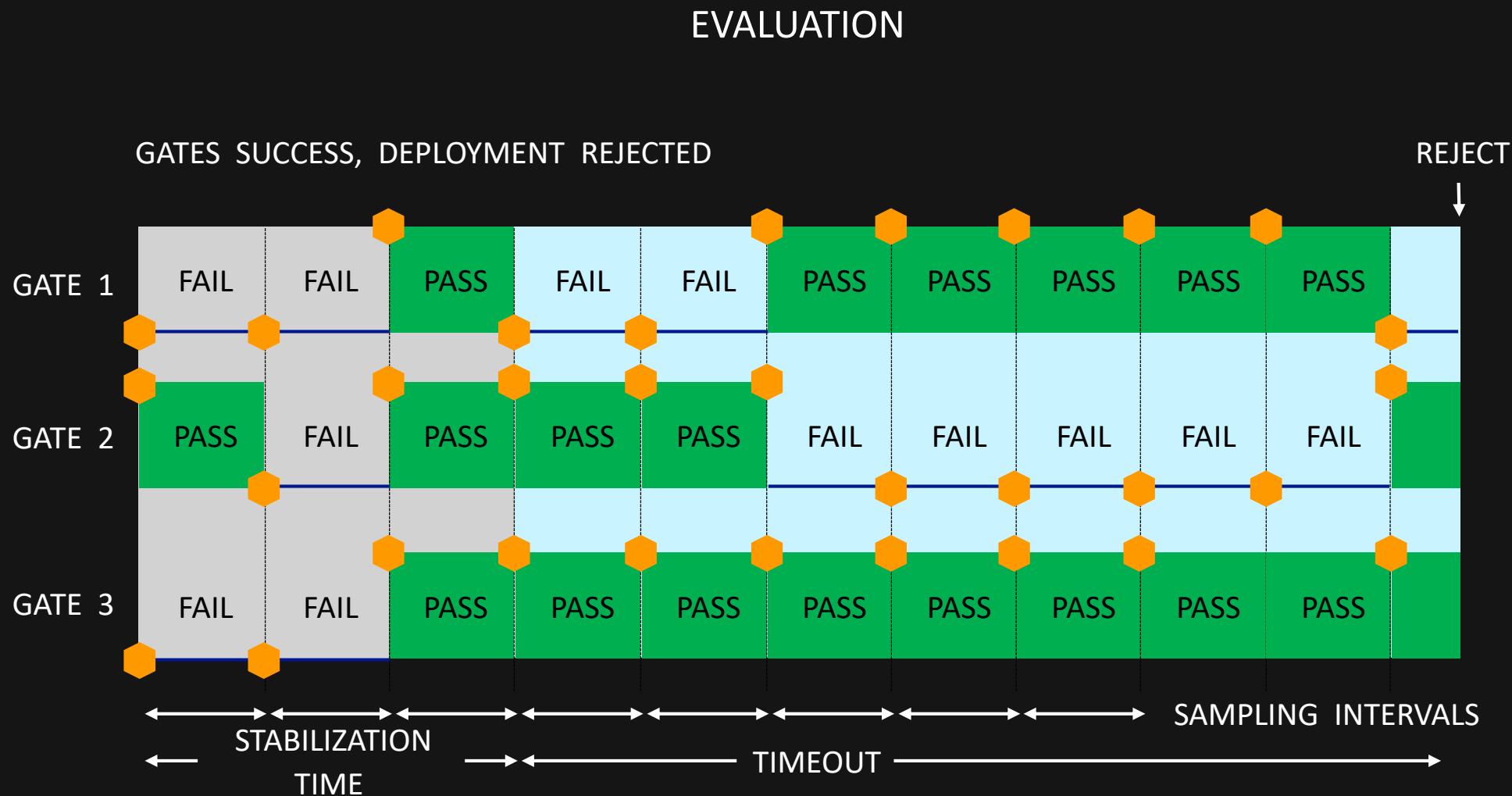
Mission #8: Release Gates



Mission #8: Release Gates



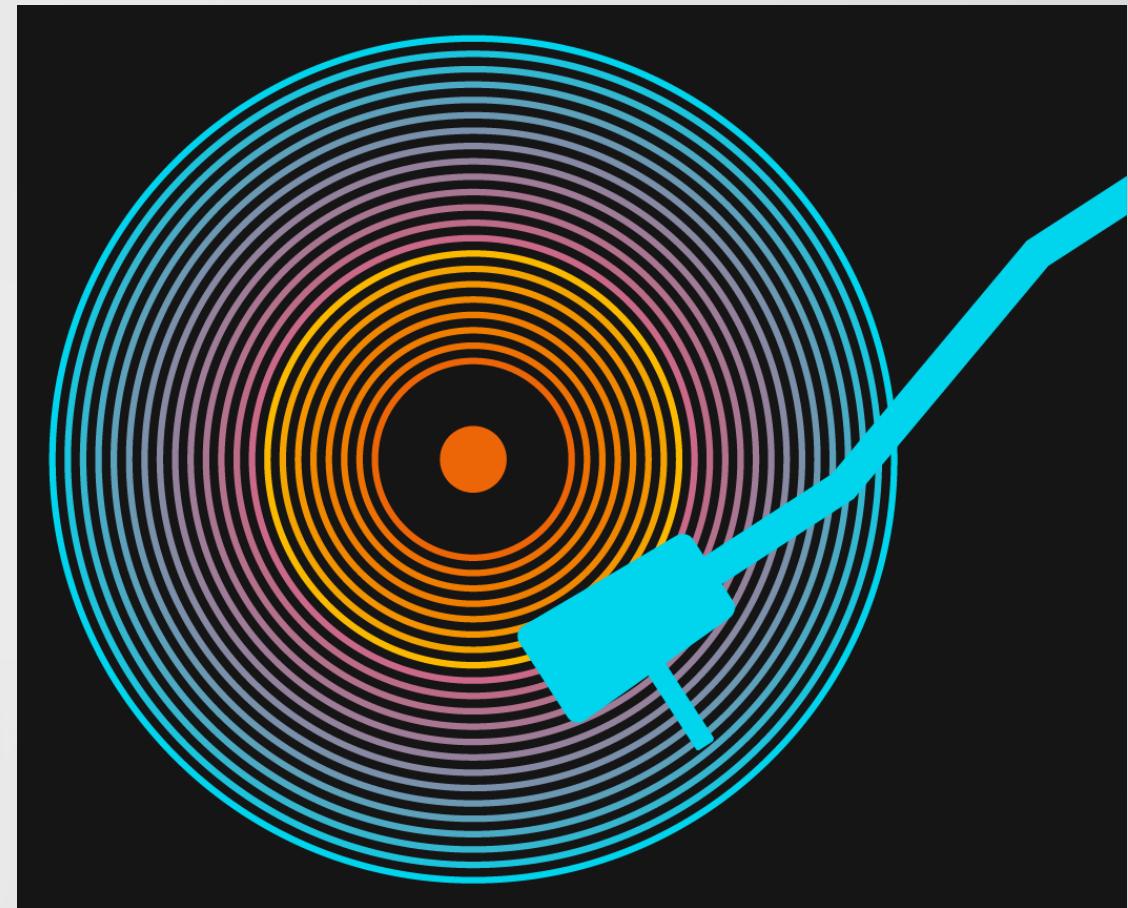
Mission #8: Release Gates



Kaya Records 2.0

DevOps Excellence

- Moved from monthly deployments to the ability to deploy multiple times per day
- Value-driven, autonomous teams
- Core application running in the public cloud
- Telemetry and reporting enabled to maximize efficiency



Final Assessment

What is Next?

- Application Upgrade – UX/MD
- System Architecture – API(s)
- System Architecture – Microservices / Containers
- System Architecture – Serverless
- Subscription Service
- Other Tech-based Revenue Streams

Conclusion



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DevOps is a Transformation

3 Pillars

Leadership

Communication

Building a Culture of Excellence

- Excellence in DevOps, as all things, can start anywhere in the organization and radiate out.
- Build empowered, self-organizing teams.
- Hoard blame.
- Share credit.

More Information

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- Technology Transformation Advisory Services

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- Leadership and Technology Blog

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