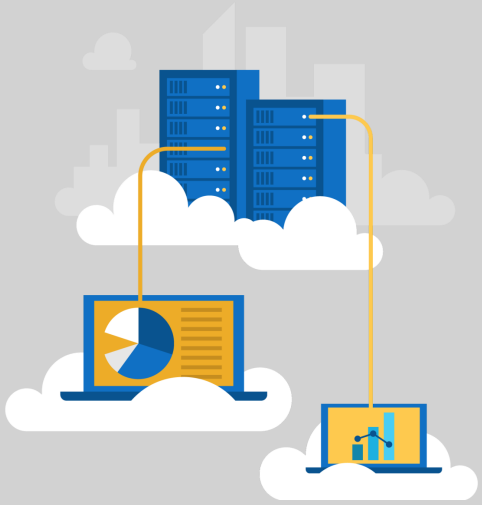
Microsoft

Module 3: Implement an Appropriate Deployment Pattern

Learning Objectives

- You learned that architecture is a prerequisite for achieving Continuous Delivery
- You know different Deployment Patterns
- You know what Blue-Green Deployment is, and how to use deployment slots in Azure to implement this
- You know what a canary release is, and how to use Azure Traffic Manager to implement this
- You know what a feature toggle is, and how they are of great importance when implementing Continuous Delivery
- You know what a Dark Launch is and how this differs from a canary release
- You know the concept of A/B testing and how this is enabled by Continuous Delivery
- You know what Progressive Exposure Deployment and Ring based deployments are and how to implement this in Azure DevOps

Lesson 01: Introduction into Deployment Patterns

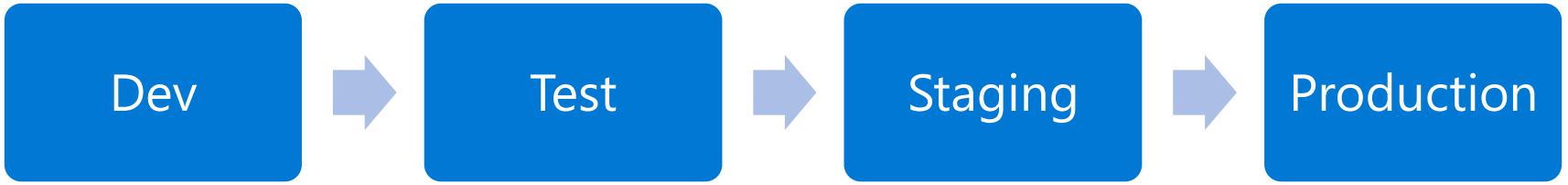


Introduction

- Continuous Delivery is more than Release Management
- Deployment is only a step
  - Testing
  - Safe Coding
  - Architecture
- Monoliths are hard to deliver because of all the dependencies
  - Break up in smaller pieces
  - Microservices

Deployment Patterns

"Classical" Deployment Patterns



Modern Practices

Blue Green Deployments

Canary Releases

Dark Launching

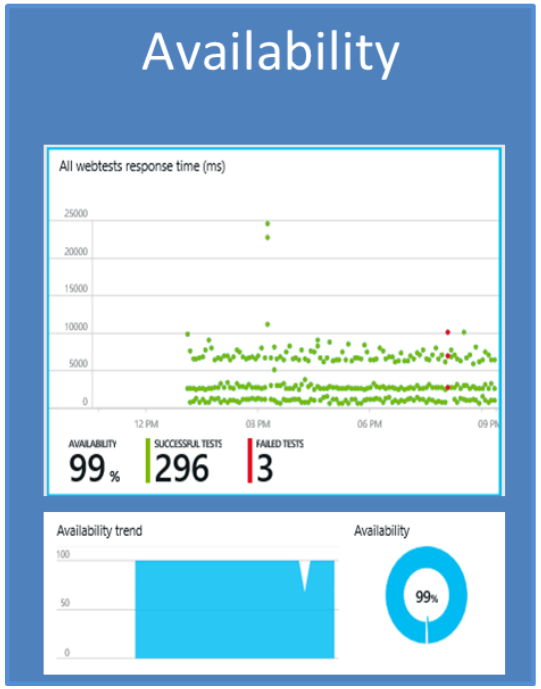
A/B Testing

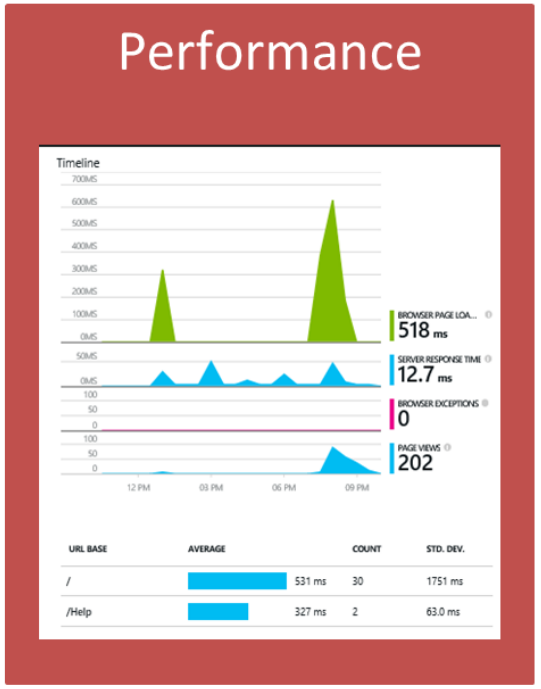
Progressive Exposure Deployment / Ring Based Deployments

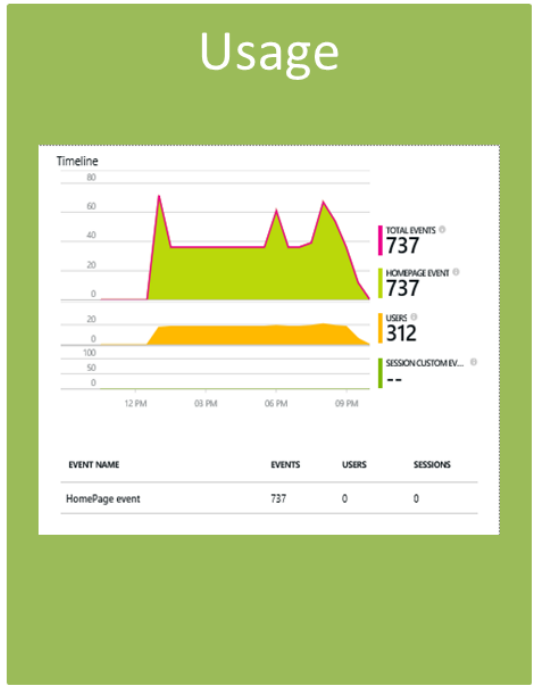
Enabled by Feature Toggles

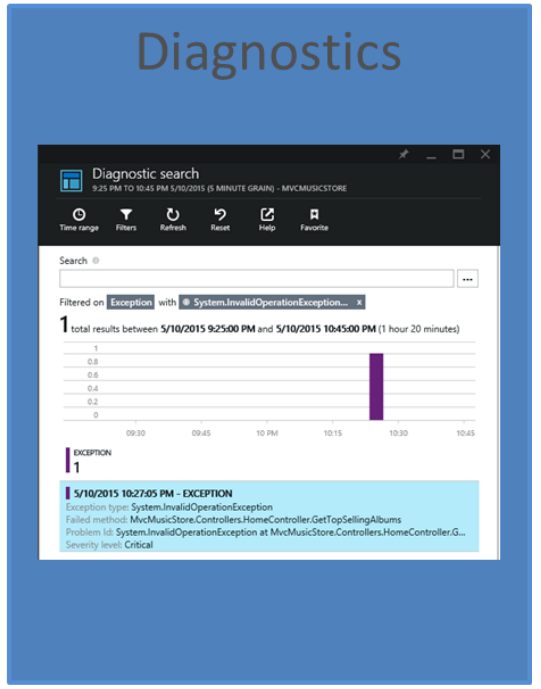
Feedback loops

E.g. use application insights

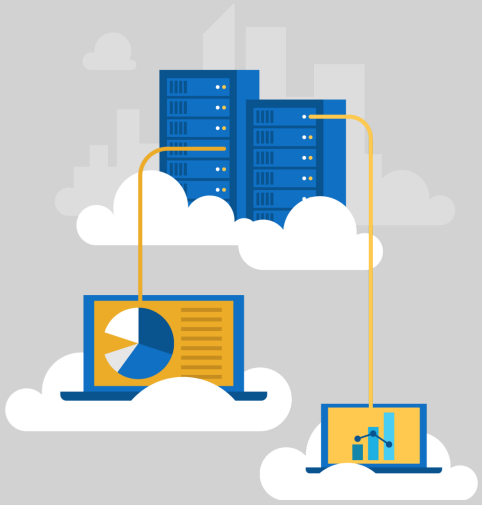




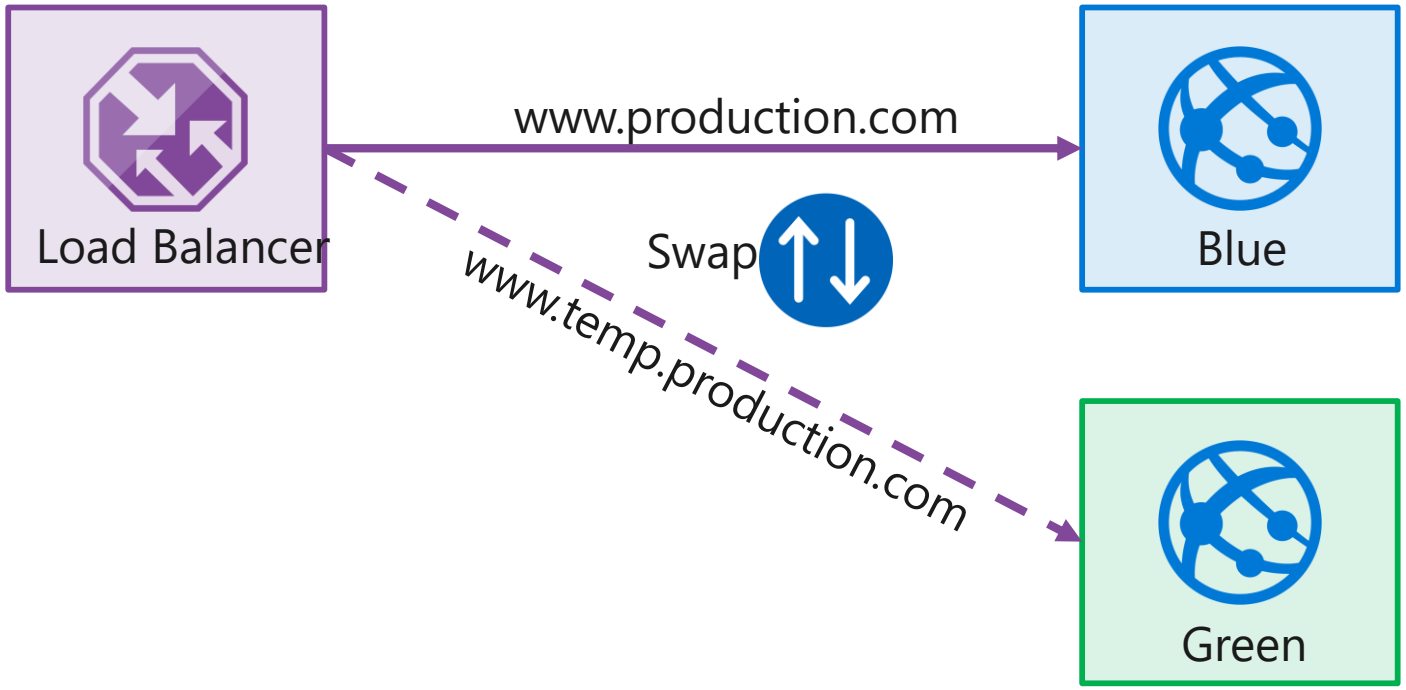




Lesson 02: Implement Blue Green Deployment



Blue Green deployment



Deployment slots

What is it?

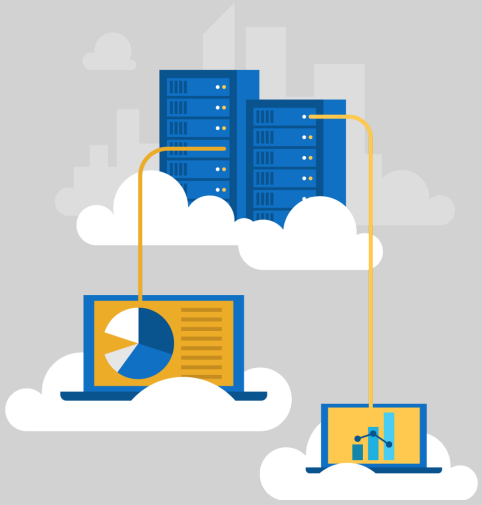
- A way to set up multiple environments and swap between environments

Why do you need it?

- When you want to deploy with zero downtime
- When you need to test in production
- When you want easy rollback

Setting up a Blue-Green deployment

Lesson 03: Feature Toggles



Feature toggles

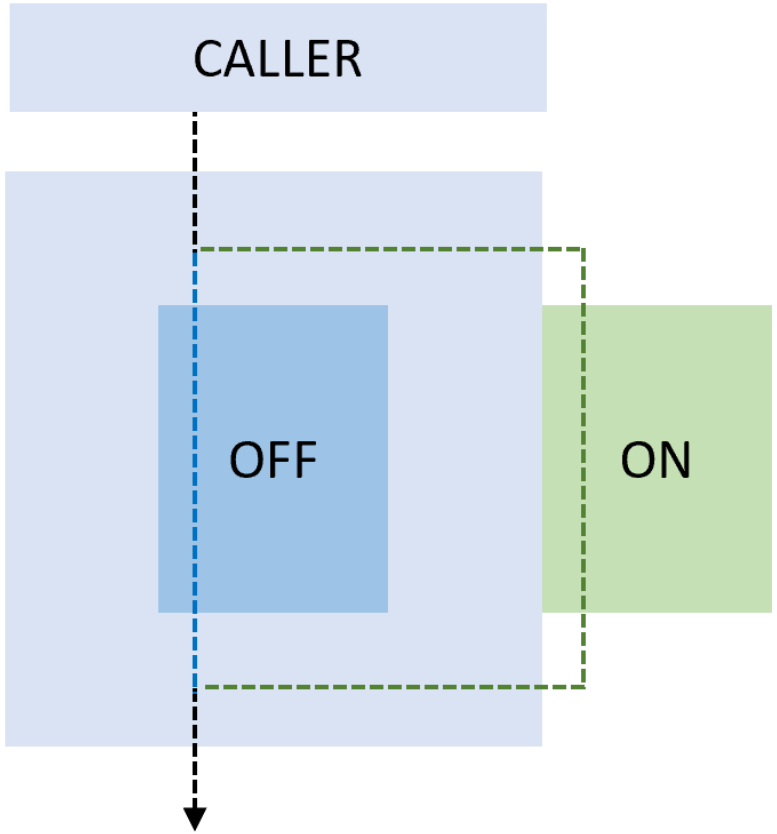
What is it?

- Mechanism to separate feature deployment from feature exposure
- A.k.a. feature flippers, feature flags, feature switch, conditional feature, etc.

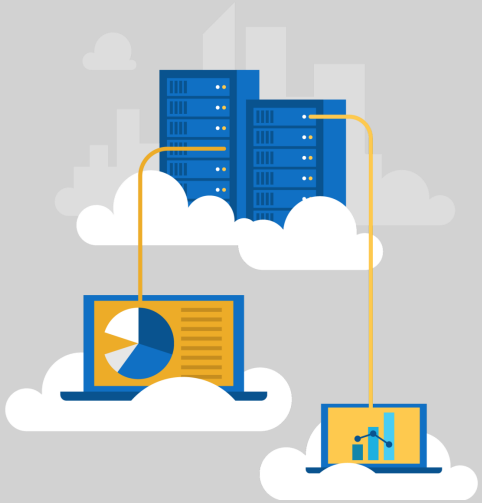
Why do you need it?

- It enables you to give control back to the business on when to release the feature
- Enables A/B testing, canary releases and dark launching
- It provides an alternative to keeping multiple branches in version control
- Enables change without redeployment

Feature toggle



Lesson 04: Canary Releases



Canary release

What is it?

- Releasing a feature to a limited subset of end users

Why do you need it?

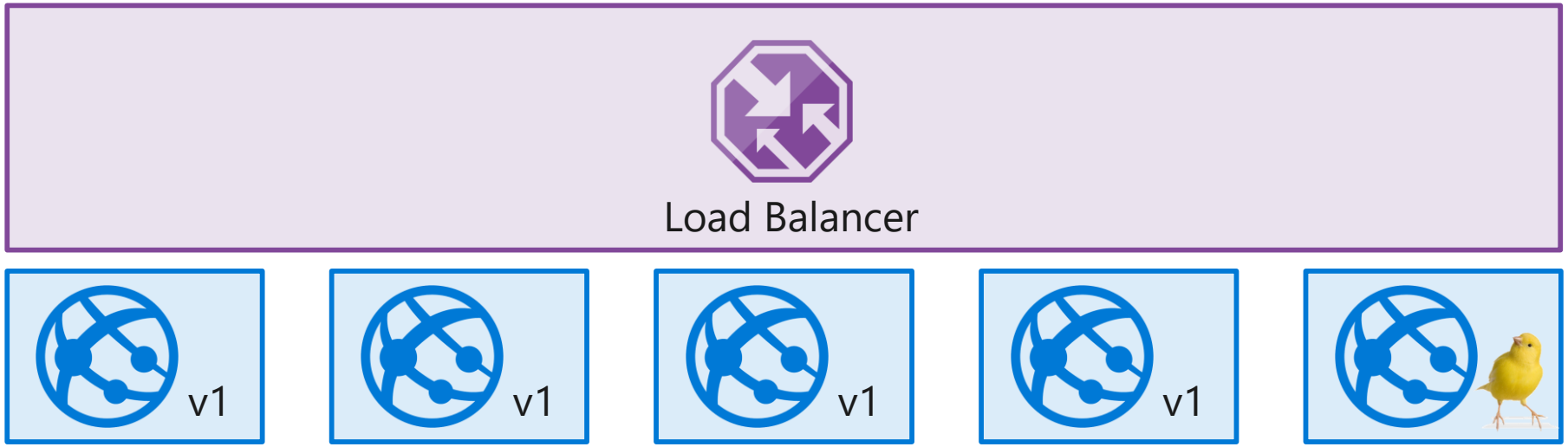
- Validates there is no break
- When you want to gradually roll out a feature to ensure enough capacity

Canary release

How do you do it?

- Use a combination of feature toggles, traffic routing and deployment slots
- Random selection of users:
  - Setup deployment slots with feature enable
  - Route %traffic to the instance with the new feature enabled
  - Target specific user segment
- Use feature toggle to enable feature for specific user segment

Canary Release



Traffic Manager

What is it?

- Traffic manager provides the ability to route traffic between Azure app services
- Within an app service, routes traffic between deployment slots

Why do you need it?

- It enables failover and load distribution capabilities
- It enables you to deploy to a slot and then slowly move traffic over to the other slot

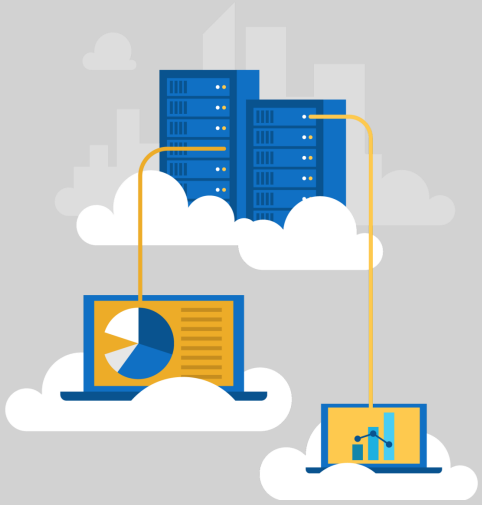
Traffic manager options

Traffic manager provides four options:

1. Route traffic based on availability
2. Route traffic round robin
3. Route traffic based on weight
4. Route traffic based on latency

In the context of continuous delivery, we are most interested in option 1 and 3

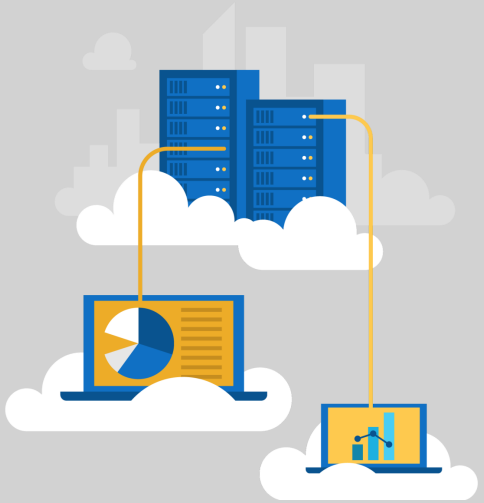
Lesson 05: Dark Launching



Dark Launching

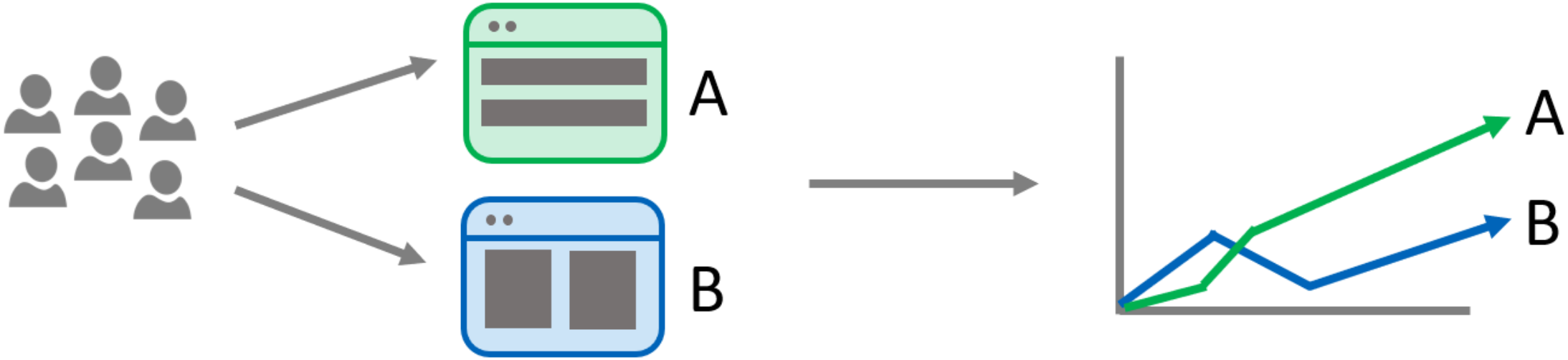
Dark Launching is in many ways similar to Canary Testing. However, the difference here is that you are looking to assess the response of users to new features in your frontend, rather than testing the performance of the backend. The idea is that rather than launch a new feature for all users, you instead release it to a small set of users. Usually, these users aren't aware they are being used as guinea pigs for the new feature and often you don't even highlight the new feature to them, hence the term **"Dark"** launching.

Lesson 06: AB Testing



A/B Testing

A/B testing is mostly an experiment where two or more variants of a page are shown to users at random, and statistical analysis is used to determine which variation performs better for a given conversion goal.



A/B Testing

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Why A/B Testing

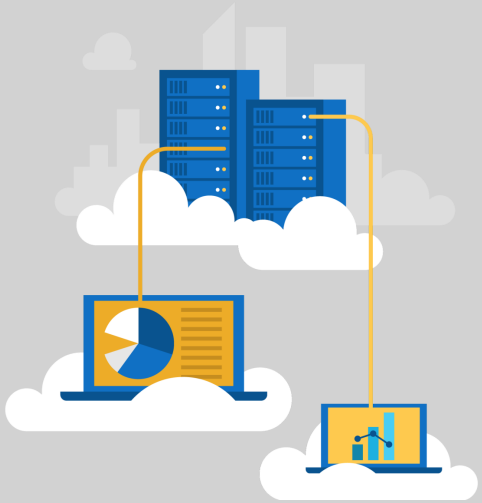
Experiment on features and usage

Improve conversion rate

Continuous experiments

Measure impact of change

Lesson 07: Progressive Exposure Deployment



What is Progressive Exposure Deployment

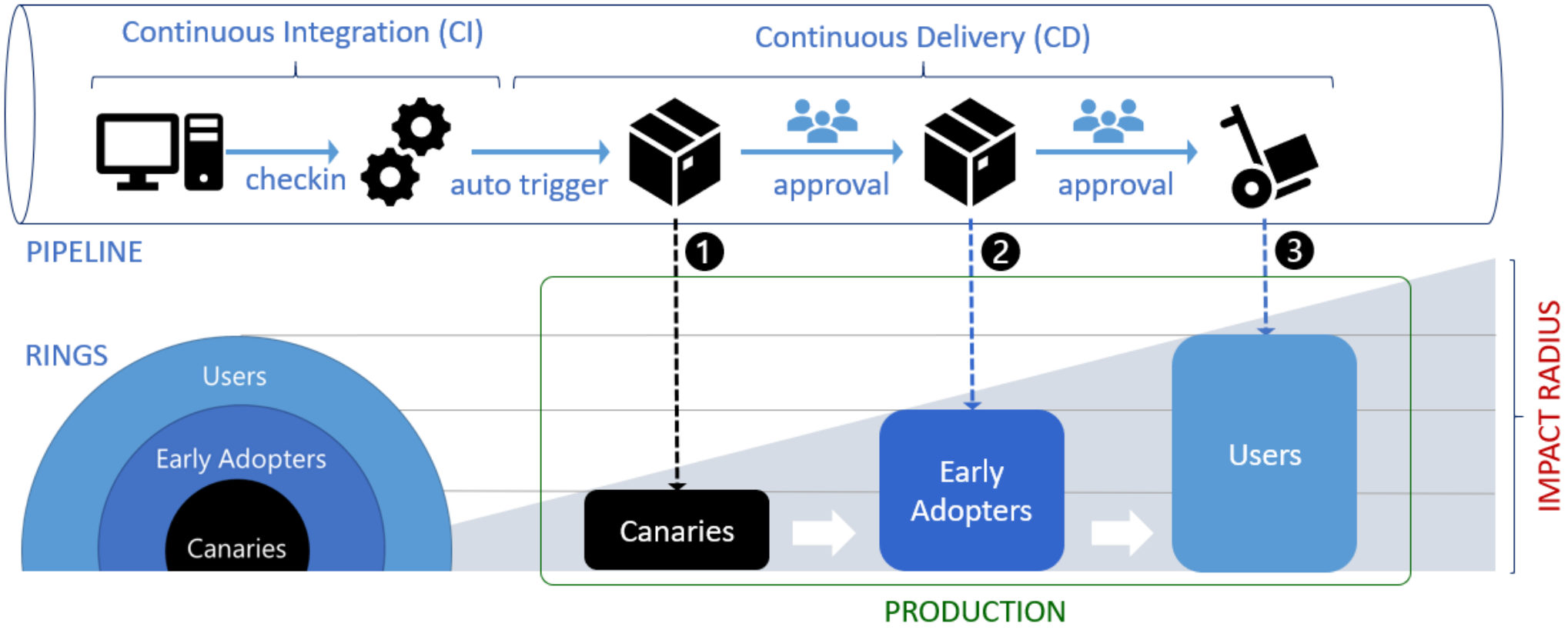
A.k.a. Ring Based Deployment

Deploy changes to risk tolerant customers first, progressively roll out to larger and larger sets of customers

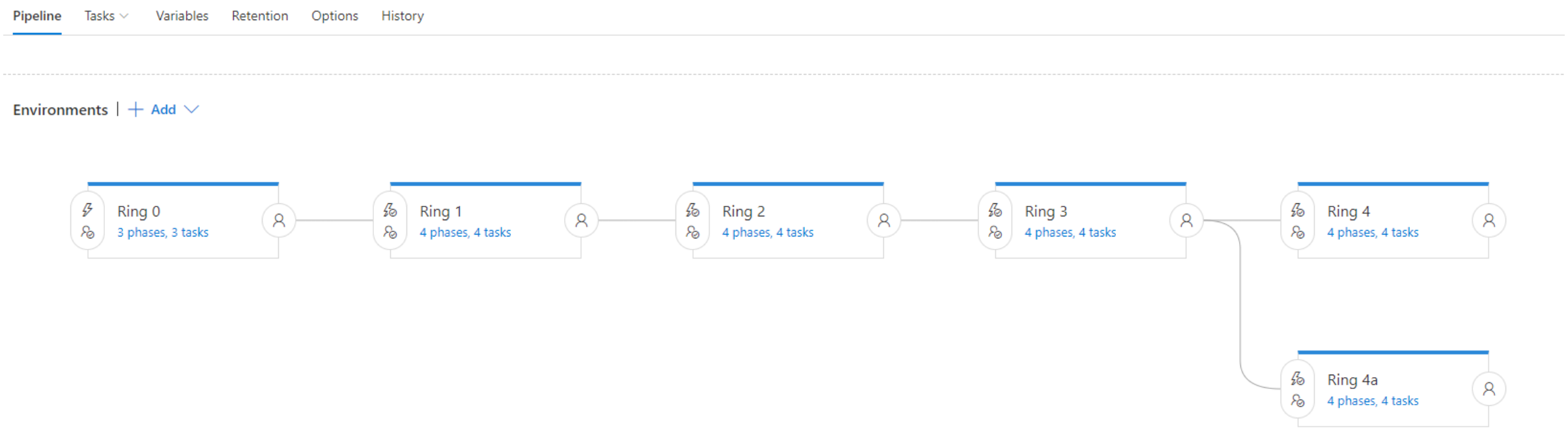
Automated health checks

Possibility to stop or roll back

CI/CD with deployment rings



Deployment Definition



In Azure DevOps, rings are modeled as Stages