Evolving DevOps to GitOps

A Perspective

Bob Wise
GM, Kubernetes
wisebob@amazon.com
@countspongebob

Motivators

Leadership knows velocity is critical to competitiveness.

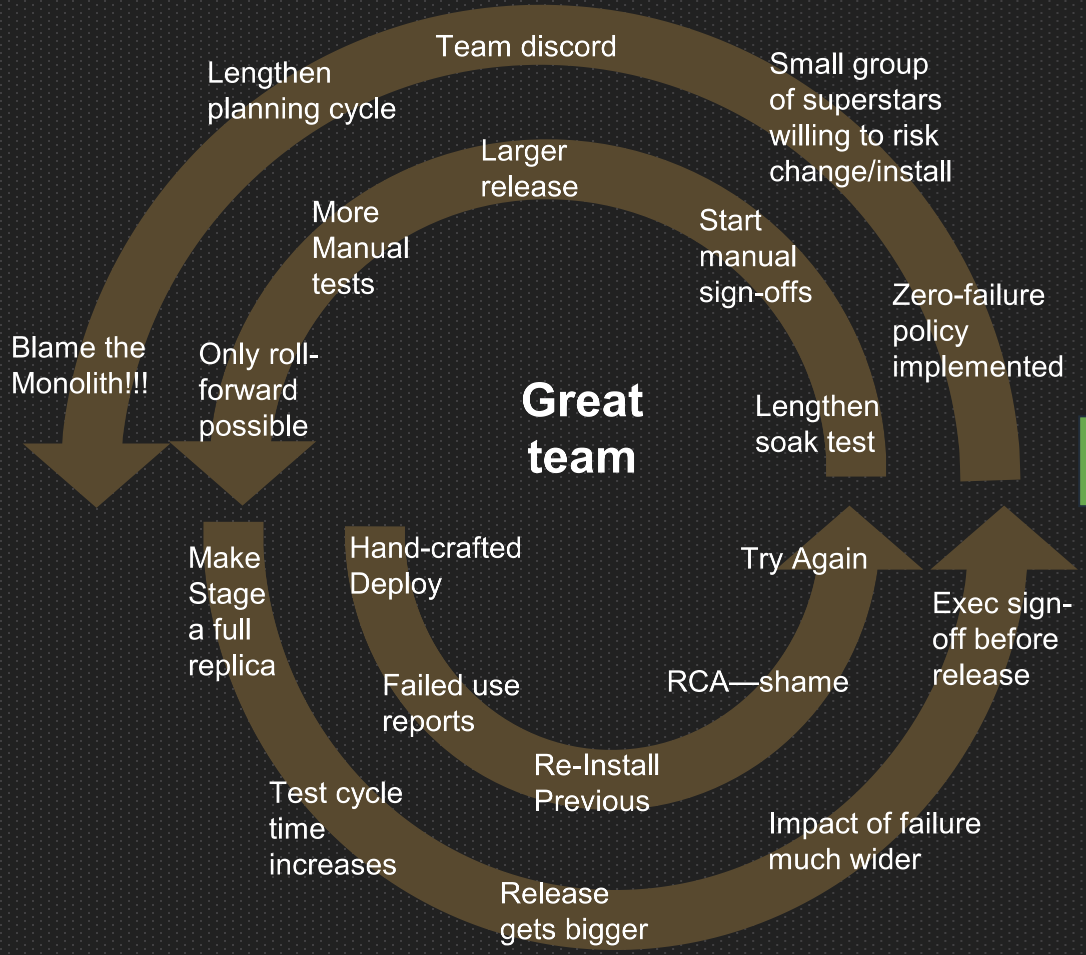
Massive velocity gap between high vs average orgs.

Desire to constrain sprawl, use fewer, better tools and approaches.

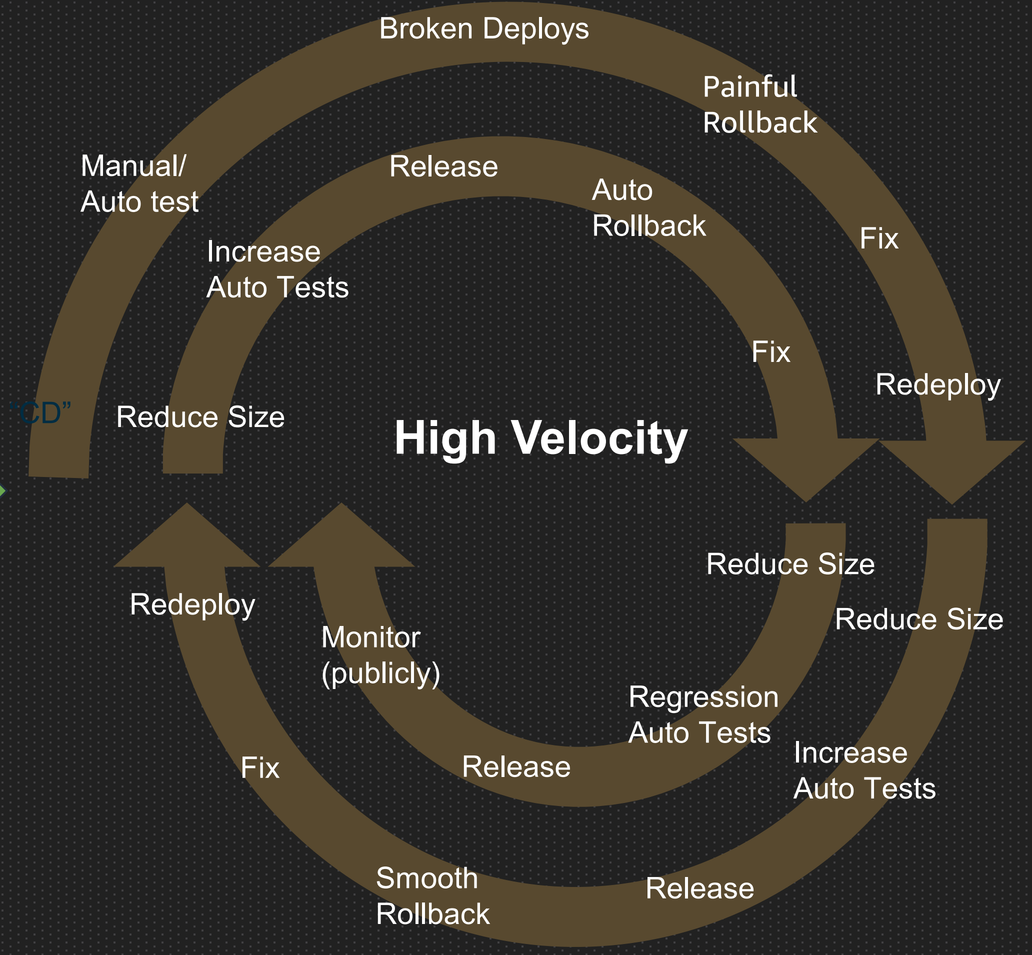
Teams needing to modernize for retention and recruiting.

Pressure to evolve…

Evolution in Processes



Spiral to Slowness



Velocity Flywheel

Effective Strategies

Focus on modern operations (CD) as the chokepoint to velocity over development improvements (Agile dev and CI).

Use container orchestration to realize CI and CD.

Incrementally evolve the entire org, not just Greenfield.

Treat operations hygiene as the *critical prelude* to microservice re-architecture: CD + observability + orchestration

Evolution of Approaches

People	→	Robots
Package managers	→	Immutable images
Config Databases	→	Configuration as Code
Siloed Teams/Tools	→	Integrated Teams/Tools
Focus on Dev Productivity	→	Holistic Velocity

Evolution Of Approaches

Manual Processes	Automation
Package managers …and Bash! ☺	Containers
Spreadsheets ☺	Configuration as Code
Dev->QA->Security->Ops	DevOps
Focus on CI	Focus on CD

Fully Automated Deployment is HARD.

Deployment Challenges

Complicated imperative dance

Ordered steps

Dependency tracking

Packaging

Versioning

Rollbacks

Evolution of Ops and CD Approaches

Imperative Automation	→	Declarative Automation
Automated Mutation	→	Immutability
Single State	→	Reconciliation/Convergence

Evolution of Ops and CD Approaches

DevOps $\rightarrow$ GitOps

GitOps

Everything in source control

Declarative configuration

Robots do all the work

Continuously converged and healed

Everything in Source Control

Managed with software engineering practices.

Human readable source of truth.

Statement of intent by the humans.

Reviewed before deployment by best practice and org policy.

Deployments triggered by merging the PR.

Declarative

Easier to reason about at scale.

Disciplined simplification.

Define intent, let robots do the work to implement.

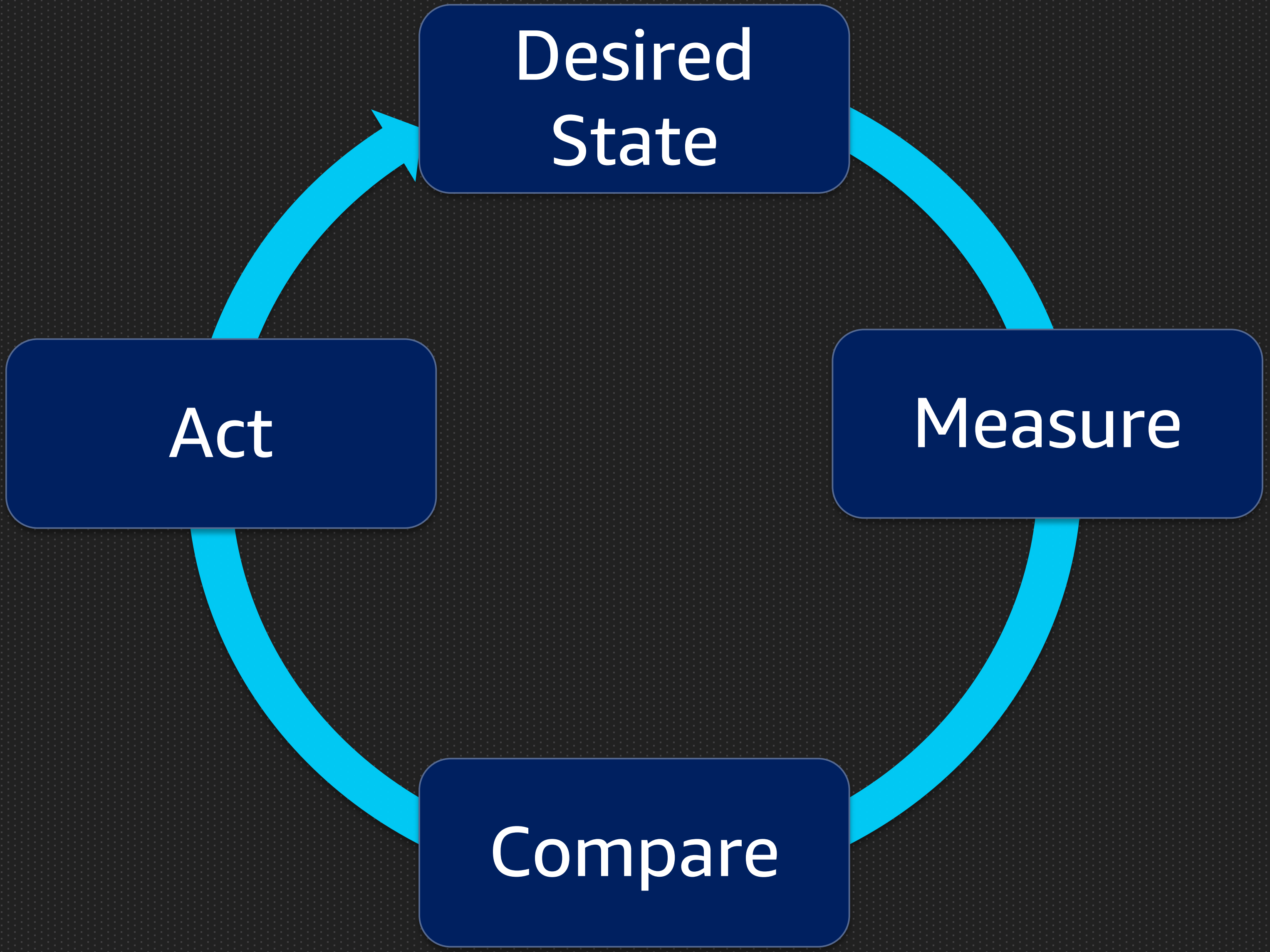
Convergence point.

Robots aren't our overlords yet: They do all the work

Most orgs terrified if humans aren't doing deployments.

High velocity orgs are terrified if they are.

Continuous Convergence / Drift Management



What’s Next?

$$\text{CD} \longrightarrow \text{PD}$$

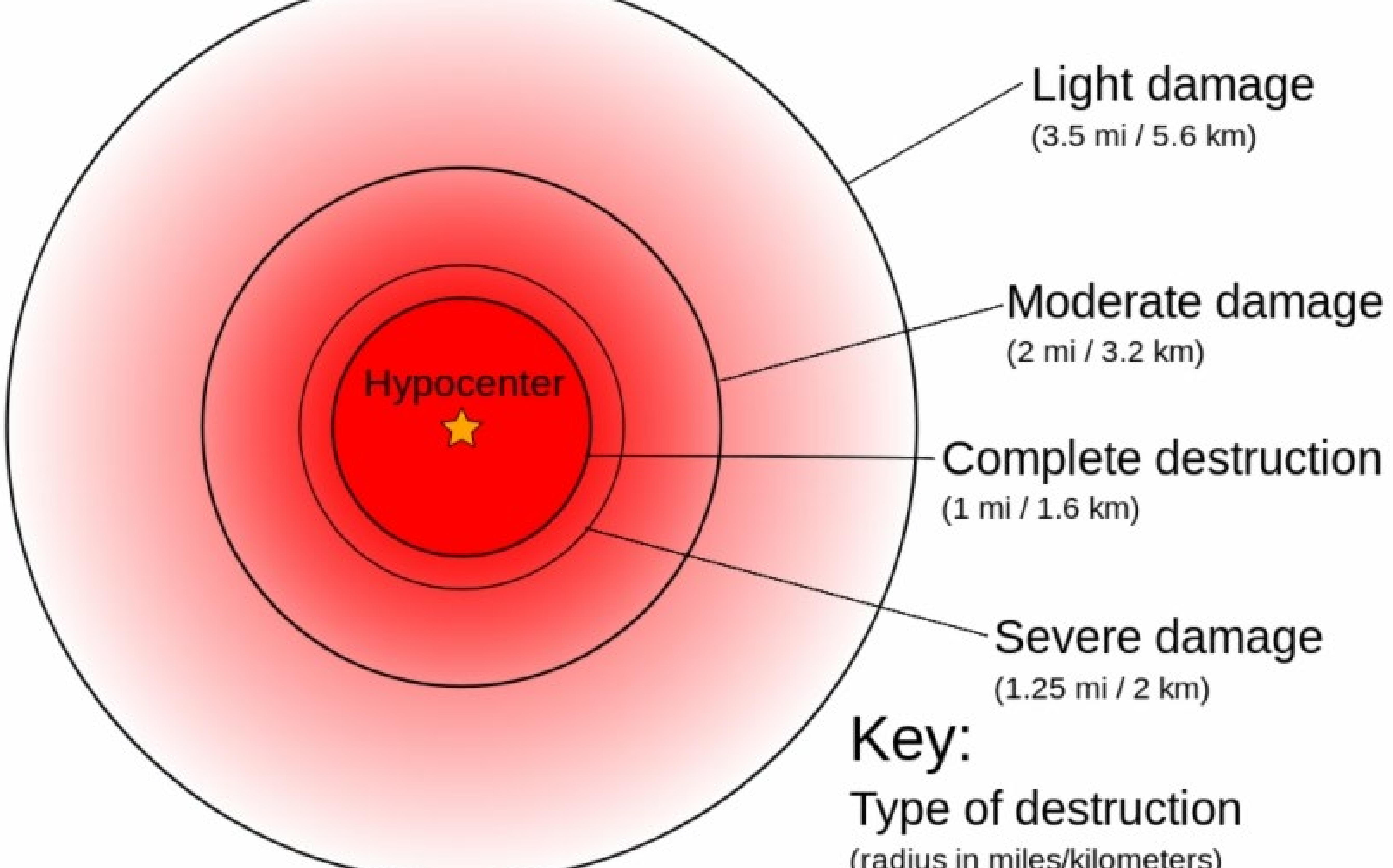
What’s Next?

$$\text{Continuous Deployment} \longrightarrow \text{Progressive Deployment}$$

What’s Next?

Continuous **D**eployment $\longrightarrow$ **P**rogressive **D**eployment

Why?

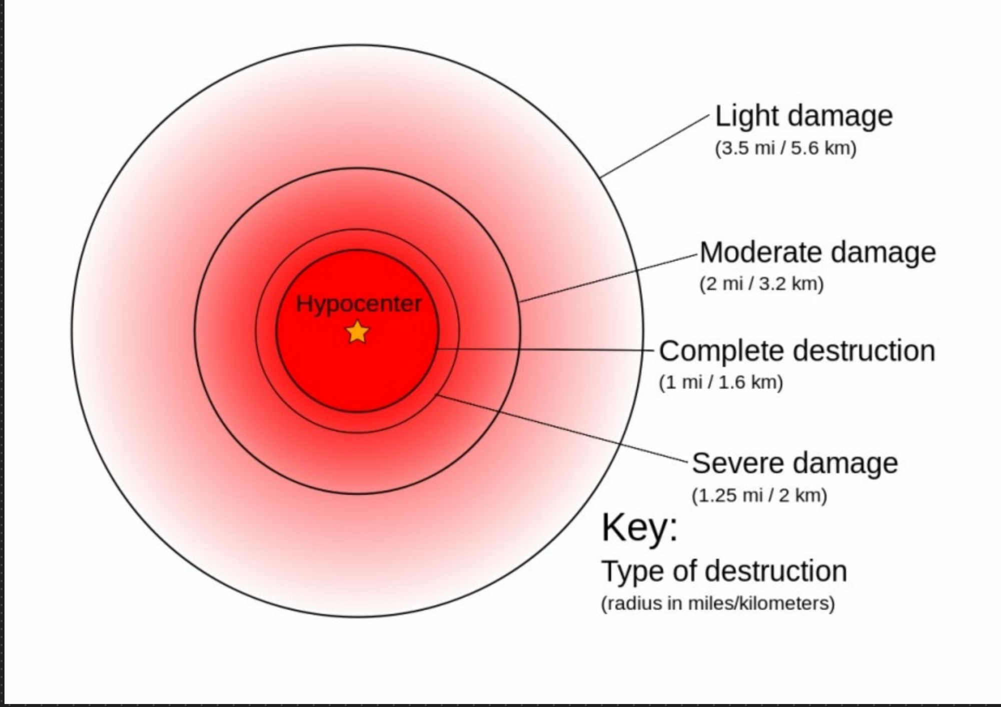

Light damage
(3.5 mi / 5.6 km)
Moderate damage
(2 mi / 3.2 km)
Hypocenter
Complete destruction
(1 mi / 1.6 km)
Severe damage
(1.25 mi / 2 km)
Key:
Type of destruction
(radius in miles/kilometers)

Progressive Deployment

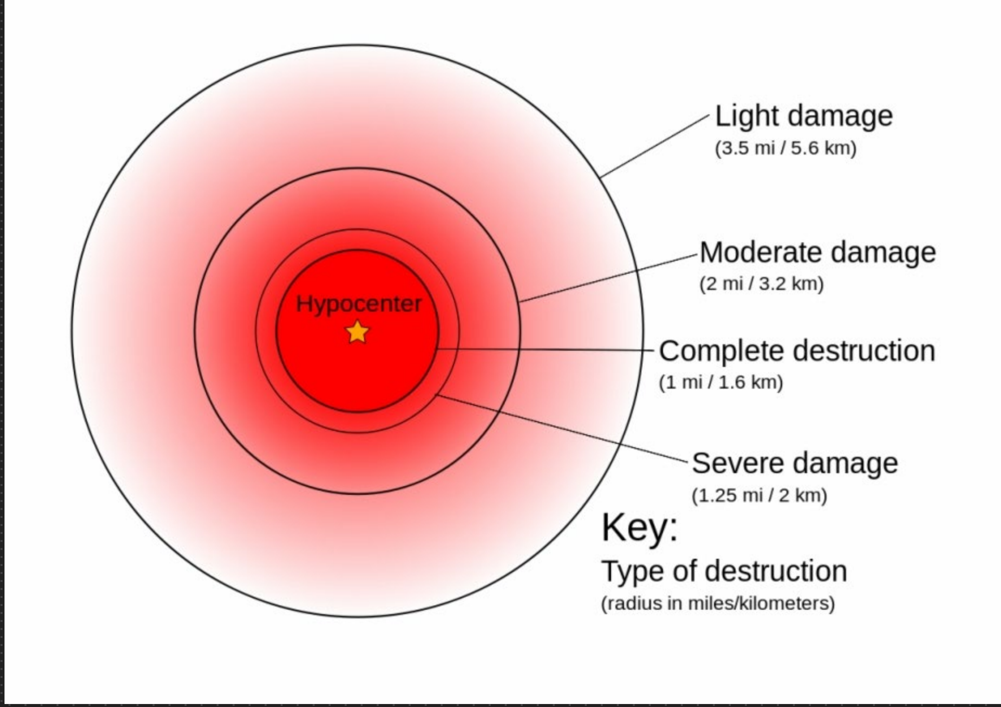
Roll out slowly, and if all tests are still passing, accelerate the pace of rollout exponentially, otherwise roll back automatically. Target 24 hours for full deploy.

Roll out slowly but fully into one region, once it has baked for a week, roll out every other region rapidly.

Roll out quickly to user profile X first, then to profile Y…



Progressive Deployment



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- Blast radius management
- Fine control over deployment strategy and execution
- Control rollout scope
- Who sees it and how much of it gets out where

Fully Automated Deployment is Complicated…

But the robots are here to help...

Kubernetes: Made for GitOps

- Supports declarative application management
- Idempotency
- Convergence
    - Controllers
    - Operators
- Immutability
- Deployments
- Ingress
- Organic healing properties

Argo CD and Flux CD are joining forces!

- Best of Flux CD and Argo CD
- Open source collaboration
- Expands GitOps ecosystem

flux

Join us in evolving Argo CD and Flux CD!

https://github.com/argoproj/gitops-engine/

aws