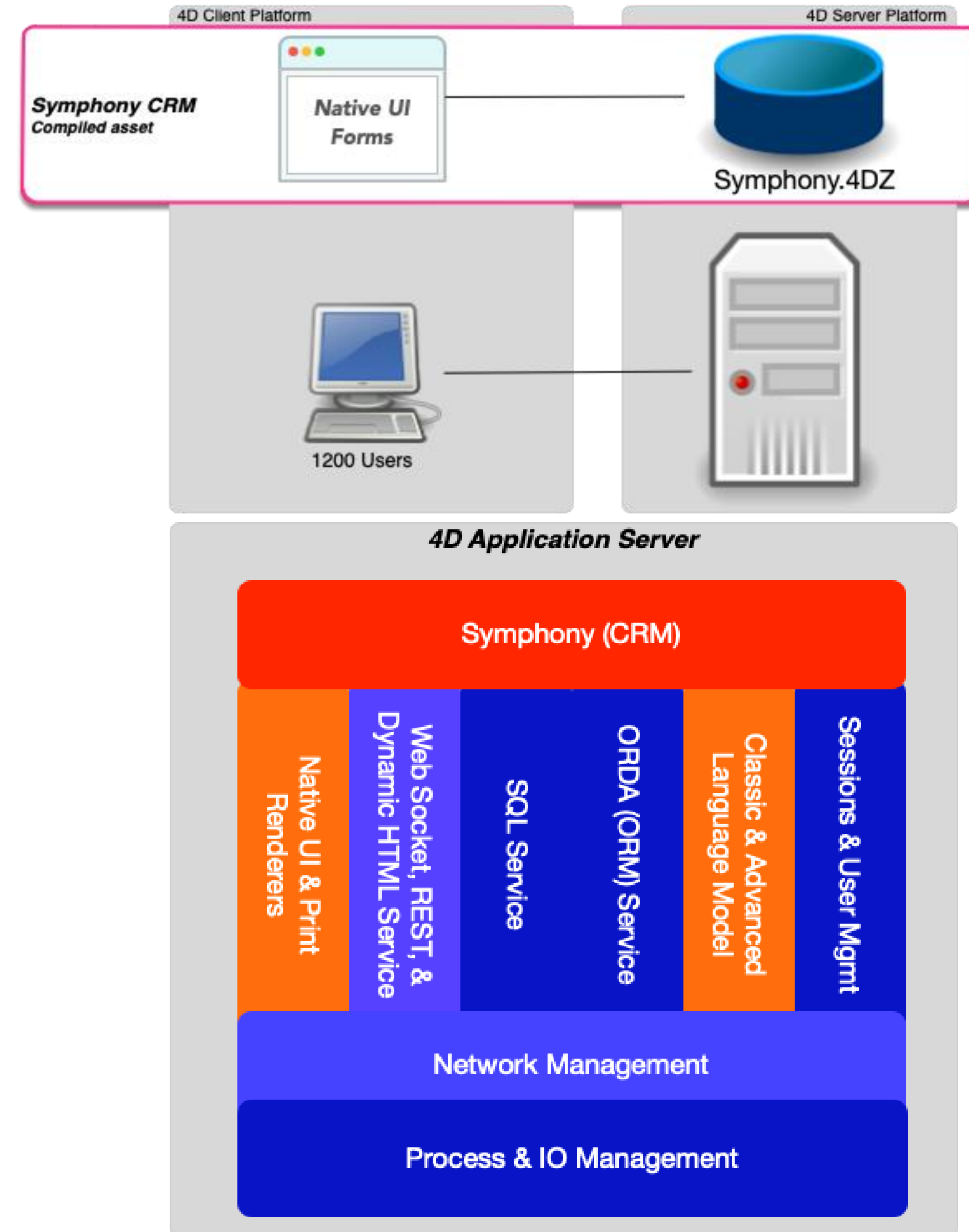# 4D Times Faster

Jeff Kain, James Scott

4D Automation

Agenda

- Symphony CRM Implementation
- Binary Mode
- Project Mode
- The Plan
- Enablers
- 4D Tooling
- GitLab Tooling
- Developer Cycle
- Deliverables
- Summary

4D is a platform native UI, database, web, mobile, and cross-platform development platform; supporting MacOS, Windows, IOS, and Android.

Symphony CRM Implementation

- Symphony Core Platform
  - Application Server
- Desktop Mac, Win, Mobile Users
- Batch & API Users
- Data Replication & Mirroring

SYMPHONY CORE PLATFORM

4D is a platform native UI, database, web, mobile, and cross-platform development platform; supporting MacOS, Windows, IOS, and Android.
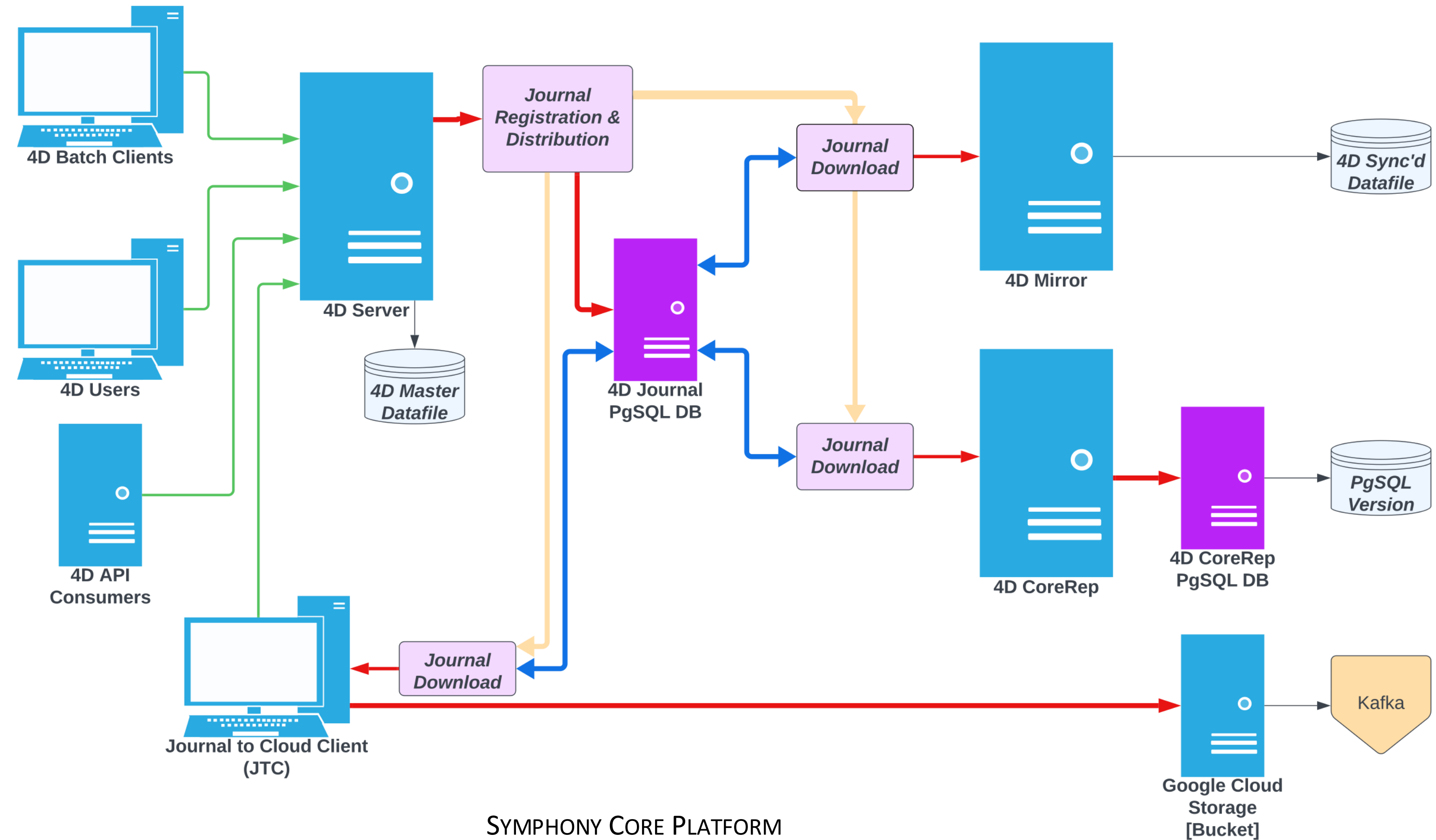
Binary Mode

Symphony

- Developers used a single 4D Server for all development work.

- 4D Server implemented source control by locking file access.

- No change history was available.

- Many human strategies were devised to allow for cooperative team development.

4D Dev

4D Dev

4D Dev

4D Dev

4D Developers

Centralized Code

4D Server
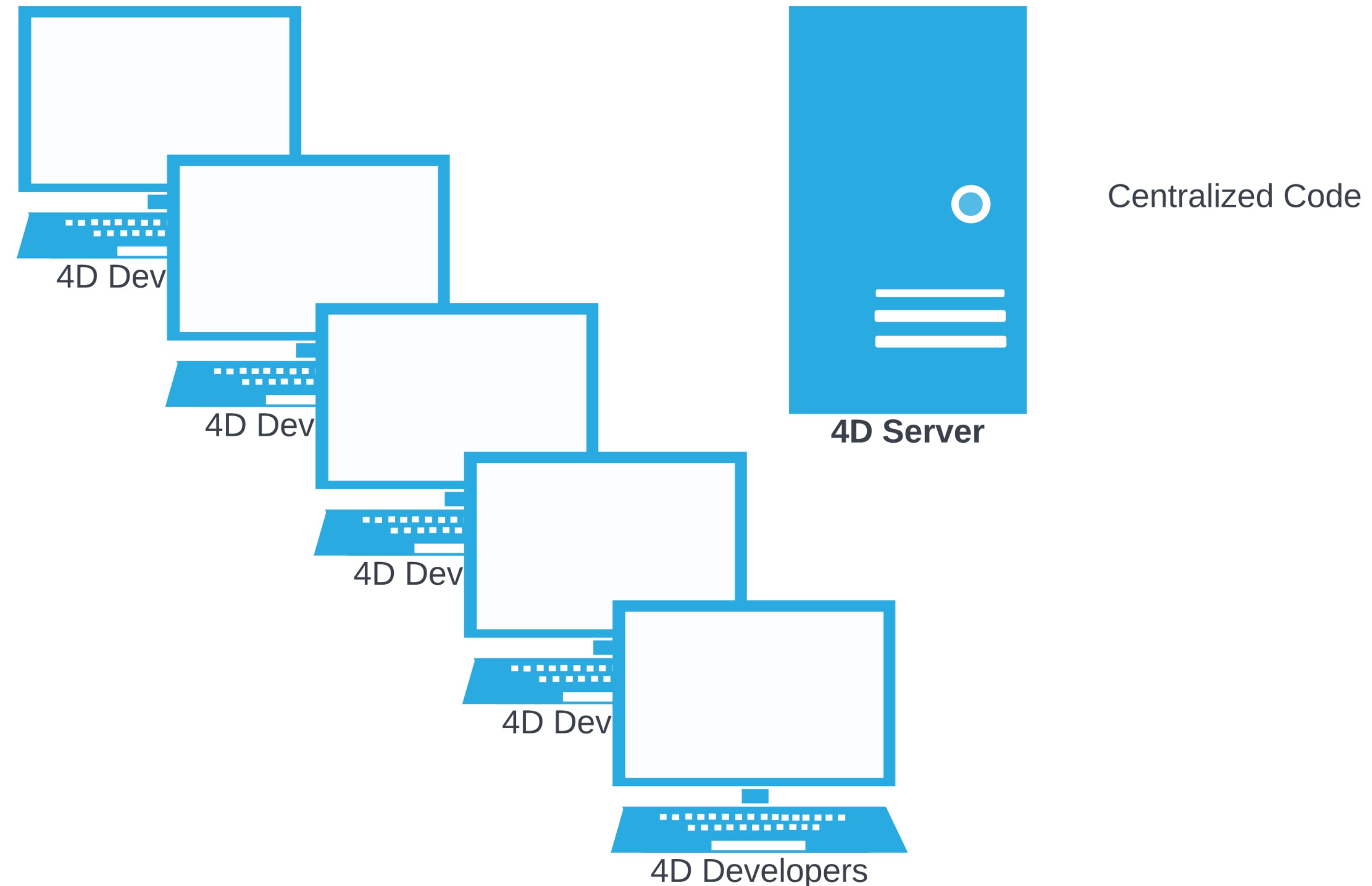
Code Freeze?

Software Release Cycle - 4D

Sweetwater®

DEVELOPMENT

WHEN?
Week 1 Tuesday to Week 3 Wednesday
WHAT?
Work through tickets to complete all assigned development in this cycle

QA RELEASE

WHEN?
Wednesday and Friday during Week 1, Week 2 and Week 3
WHAT?
Test changes released in each QA release

REVIEW

WHEN?
Within 48 hours of receiving code review
Final code reviews are Week 3 Thursday and Friday
WHAT?
Code reviews -- No further development except for changes required by code review
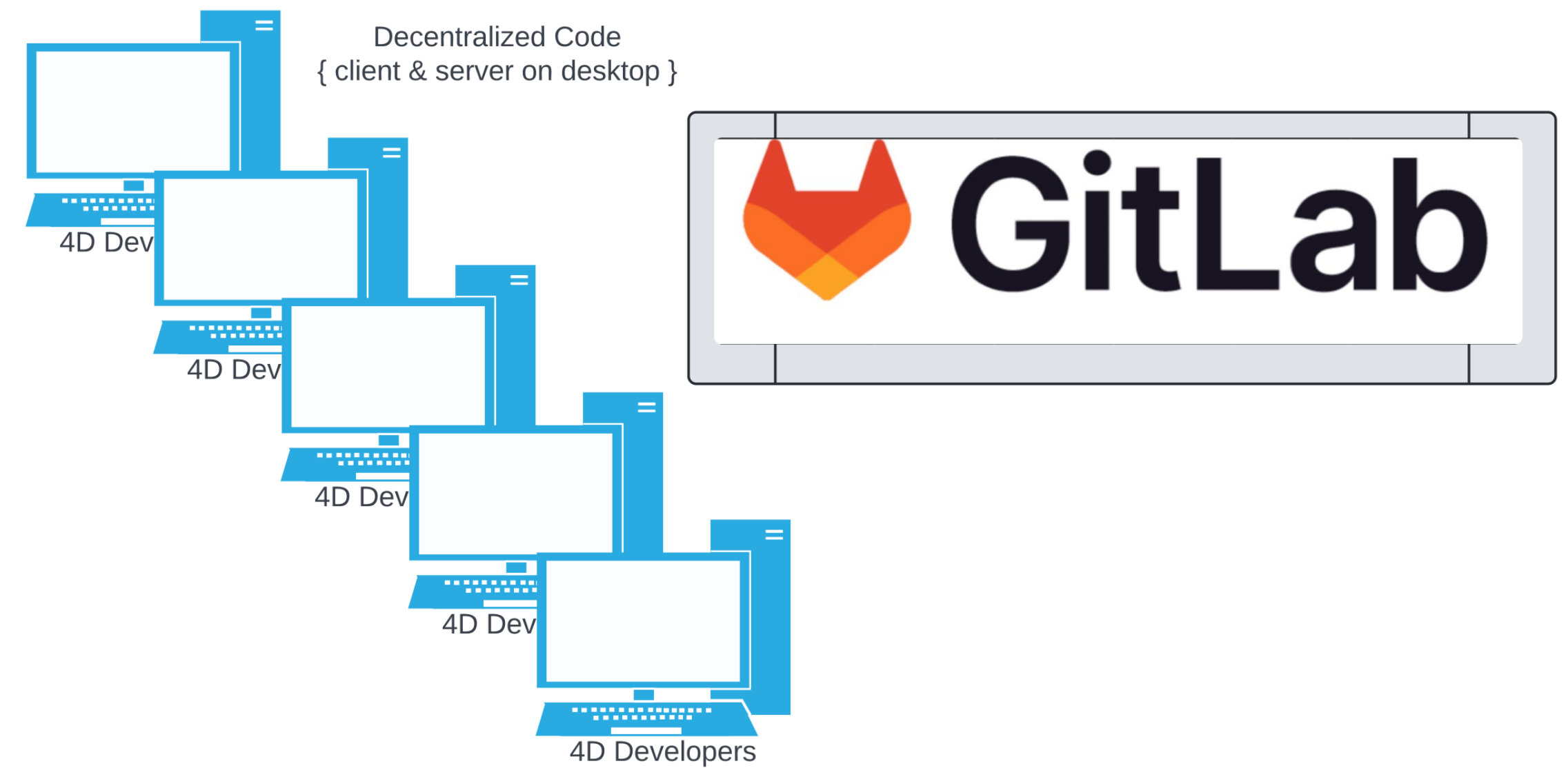
CODE SPLIT

WHEN?
Week 3 Friday @ 3:00 PM
WHAT?
Dev server is in complete code freeze until the next build cycle begins except for changes found during QA testing

TESTING

WHEN?
Week 4
WHAT?
Round Robin / QA / UA test all completed code for this build cycle
Certify the completed build

PACKAGE BUILD

WHEN?
Week 1 Monday
All Day
WHAT?
Complete anything outstanding with the build

RELEASE

WHEN?
Week 1 Monday @ 11:59 PM
WHAT?
The certified build is released

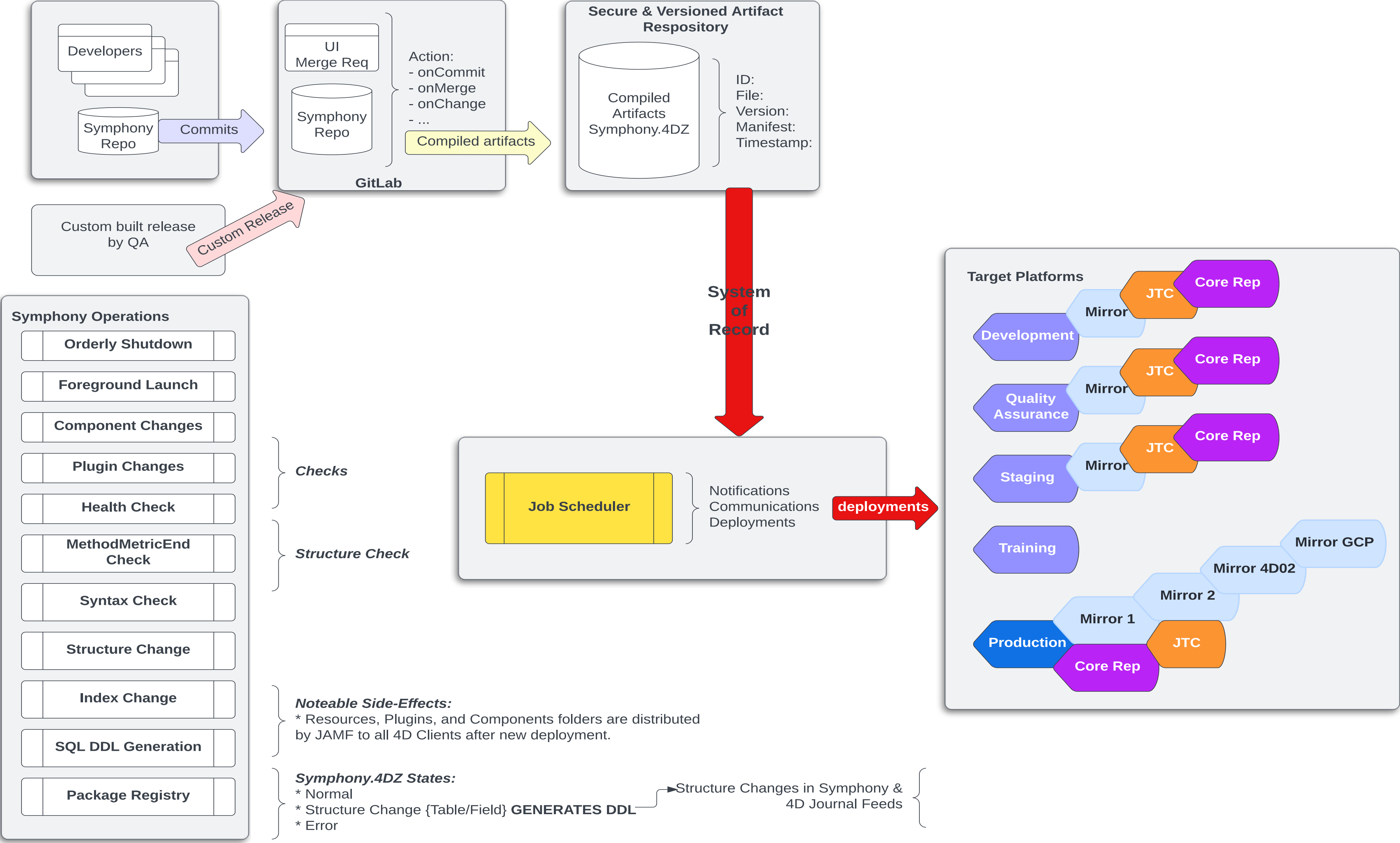|	MON	TUE	WED	THR	FRI
Week 1		■	■ ✦	■	■ ✦
Week 2	■	■	■ ✦	■	■ ✦
Week 3	■	■	■ ✦	■	■ ✦
Week 4	■	■	■	■	■
Week 1	■ ✦				
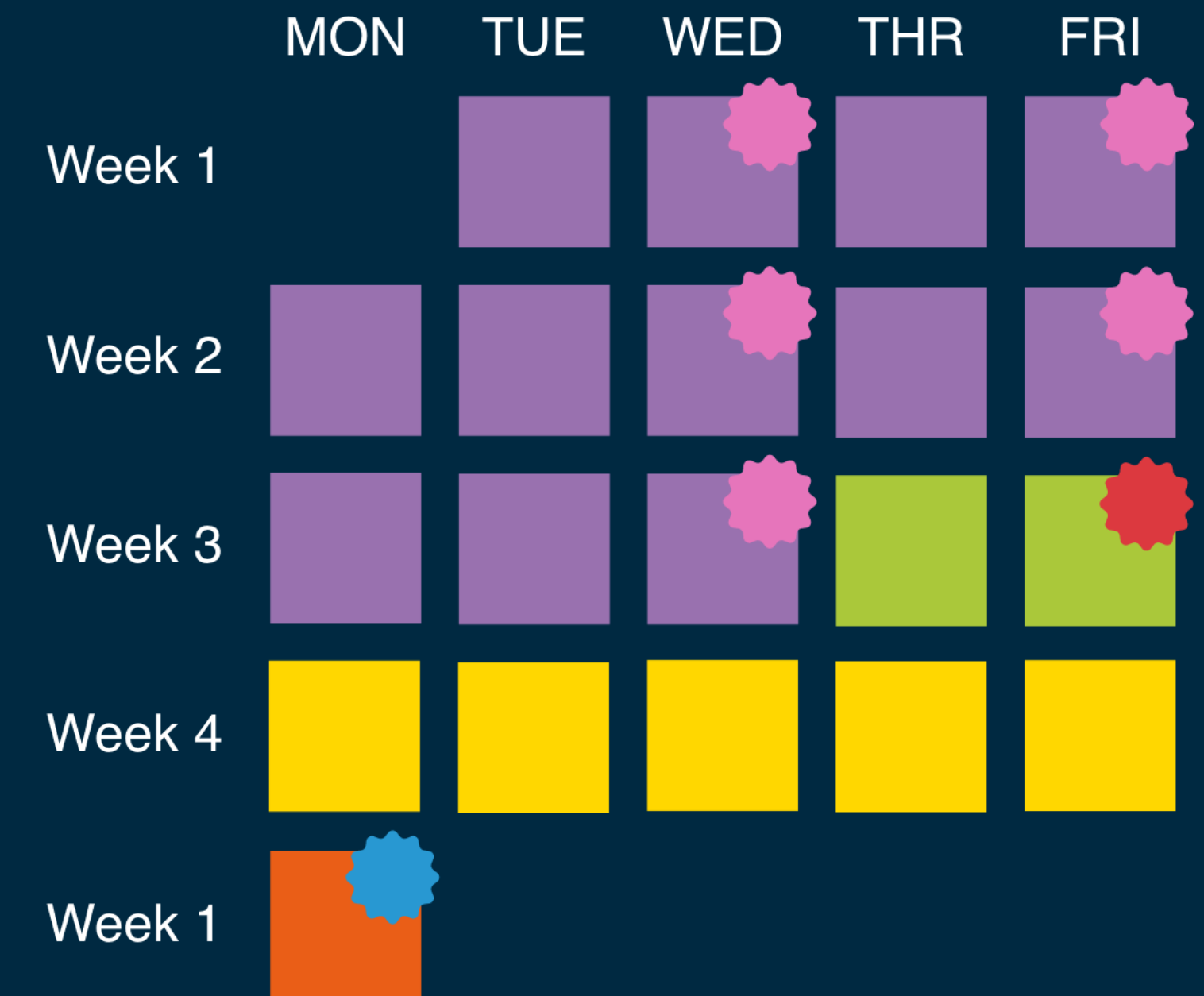
Project Mode

Symphony

- Moderate effort to transistion to plain text Project Mode.

- Source control is fully enabled.

- No Code Freeze

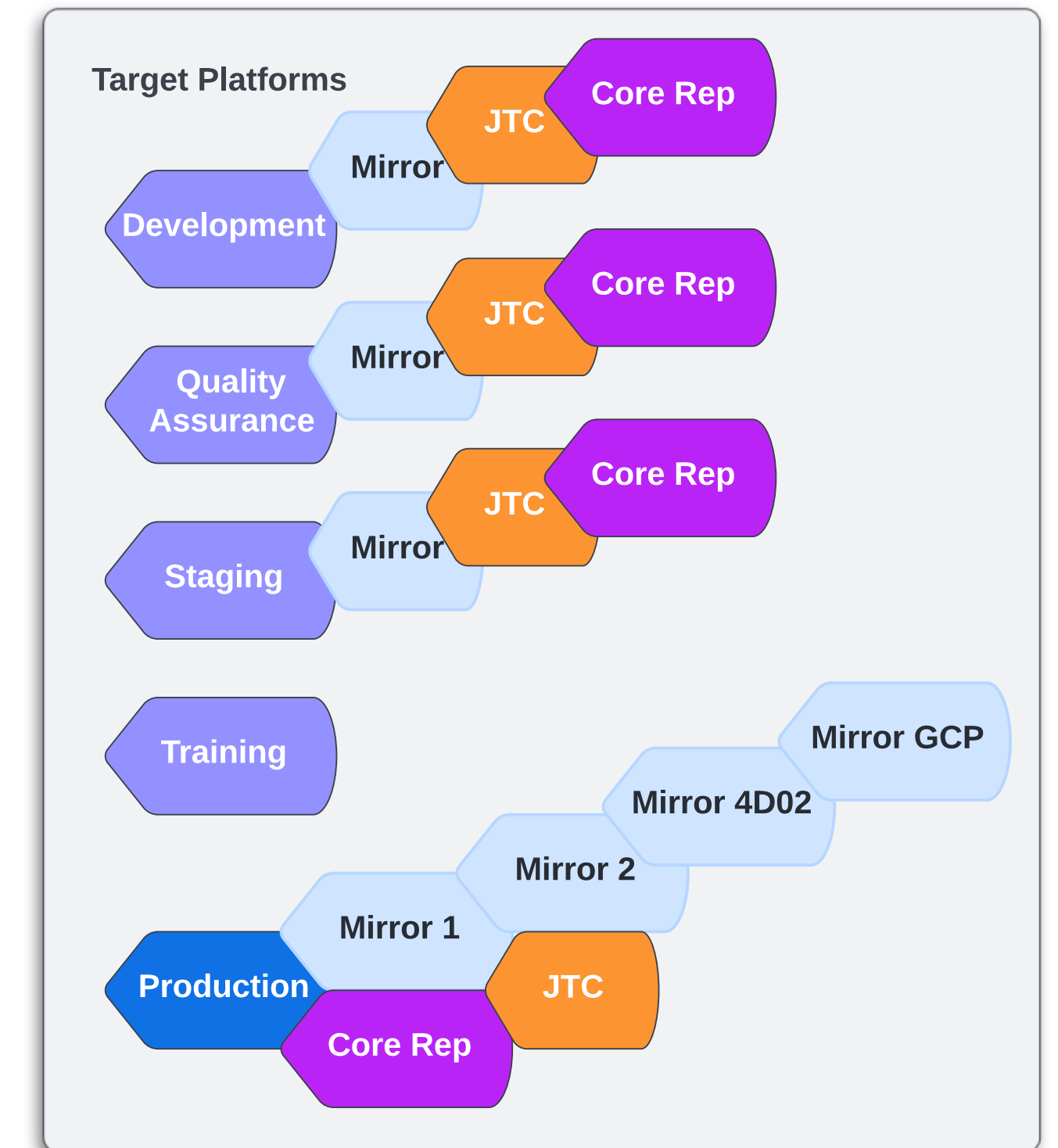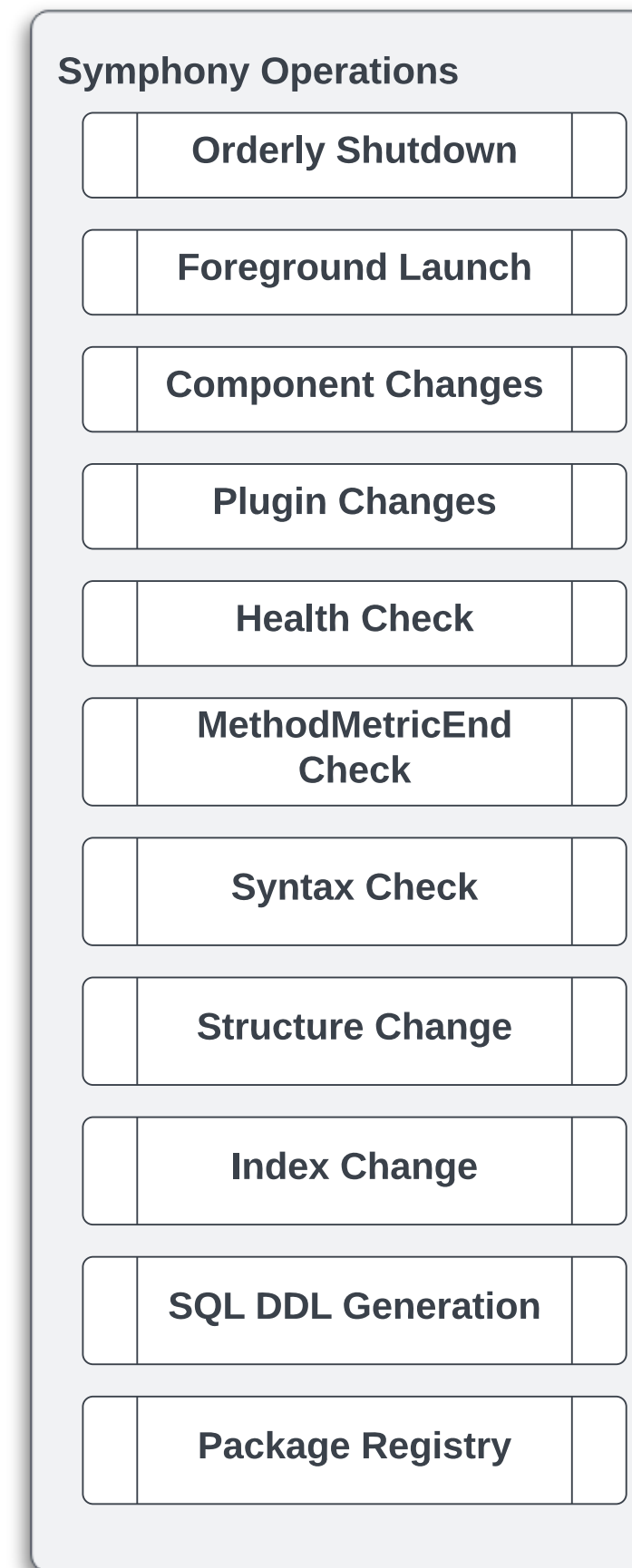Decentralized Code
{ client & server on desktop }

4D Dev
4D Dev
4D Dev
4D Dev
4D Developers

GitLab

The Plan

Developers

Symphony Repo → Commits →

GitLab

UI Merge Req

Symphony Repo

Action:
- onCommit
- onMerge
- onChange
- ...

→ Compiled artifacts →

Secure & Versioned Artifact Respository

Compiled Artifacts Symphony.4DZ

ID:
File:
Version:
Manifest:
Timestamp:

Custom built release by QA → Custom Release →

System of Record

Symphony Operations

| Orderly Shutdown |
| Foreground Launch |
| Component Changes |
| Plugin Changes | ⎱ *Checks* |
| Health Check |
| MethodMetricEnd Check | ⎱ *Structure Check* |
| Syntax Check |
| Structure Change |
| Index Change |
| SQL DDL Generation |
| Package Registry |

Noteable Side-Effects:
* Resources, Plugins, and Components folders are distributed by JAMF to all 4D Clients after new deployment.

Symphony.4DZ States:
* Normal
* Structure Change {Table/Field} **GENERATES DDL** → Structure Changes in Symphony & 4D Journal Feeds
* Error

Job Scheduler

Notifications
Communications
Deployments

→ deployments →

Target Platforms

Development — Mirror — JTC — Core Rep

Quality Assurance — Mirror — JTC — Core Rep

Staging — Mirror — JTC — Core Rep

Training

Production — Mirror 1 — Mirror 2 — Mirror 4D02 — Mirror GCP

Core Rep — JTC

Enablers

Symphony's codebase was changed to implement or support these minimal operations

Symphony Operations

- Orderly Shutdown
- Foreground Launch
- Component Changes
- Plugin Changes
- Health Check
- MethodMetricEnd Check
- Syntax Check
- Structure Change
- Index Change
- SQL DDL Generation
- Package Registry

Target Platforms

- Development — Mirror — JTC — Core Rep
- Quality Assurance — Mirror — JTC — Core Rep
- Staging — Mirror — JTC — Core Rep
- Training
- Production — Mirror 1 — Mirror 2 — Mirror 4D02 — Mirror GCP
- Production — JTC — Core Rep

4D Tooling

Symphony

- Tooling for Syntax, Structure, Indexes, and noMethodMetricEnd checks

- SQL DDL Generation (CoreRep)

- Compile & Build 4DZ

- Automated Shutdown & Launch

- Generate DDL if Structure change

- UDP health check to verify deployment
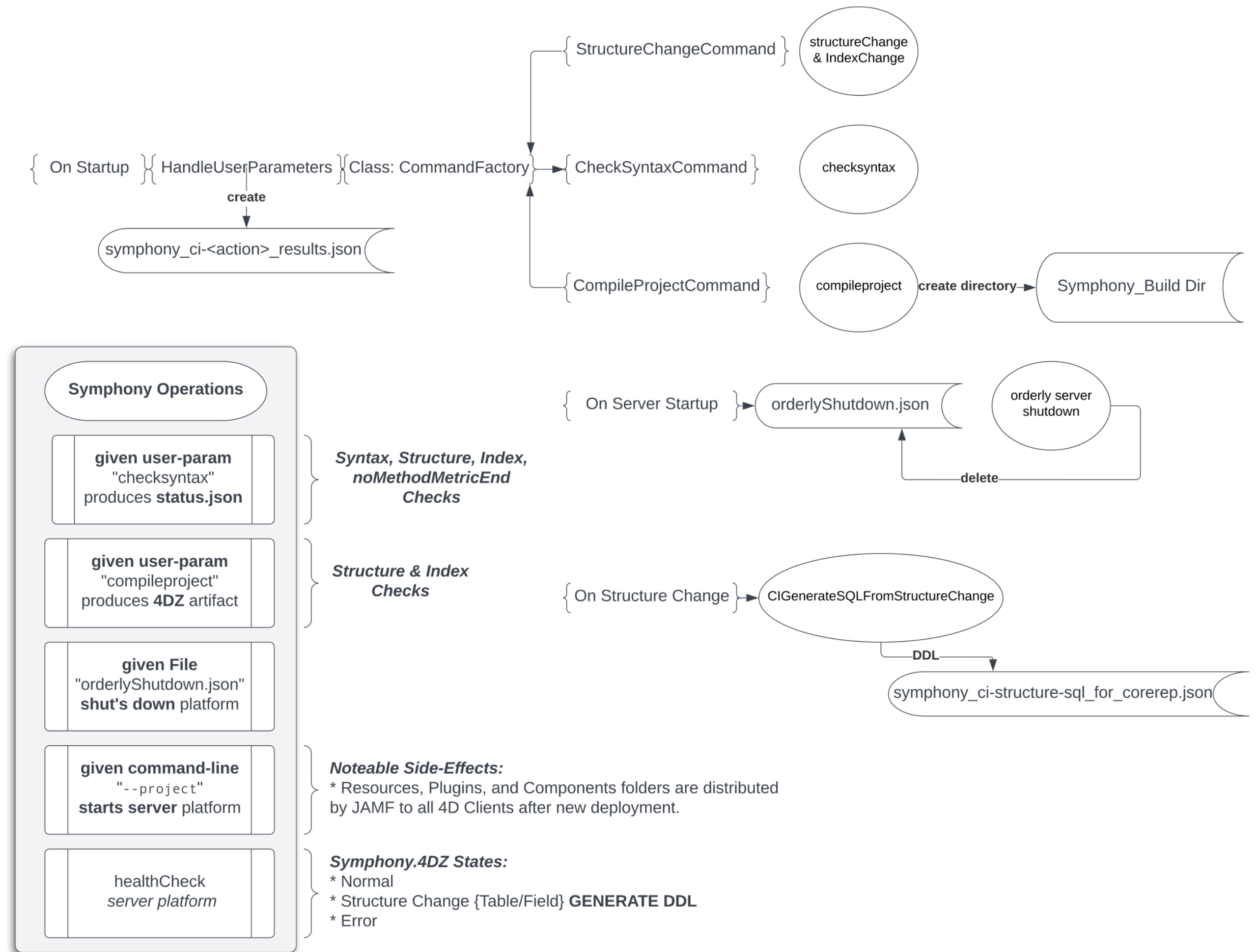
4D Tooling

QA Tooling

- 4DScheduleDeploy

  - Local 4D Application.

  - Structures the collection of GitLab attributes to create a scheduled deploy of any branch or tag, to any target platform.

  - Meant for QA personnel.

GitLabTooling

Symphony

- Notifications via Platform Engineering Bot.

- Self-Hosted dedicated GitLab Runners.

- GCE proxy to access Components & Plugins located in GCE bucket.

- Secrets (Vault) management.

- JIRA Integration.

- GitLab workflow features.

- DataDog Integration.

|		
Platform Engineering Bot Notifications	Platform Engineering Release Manager 4D Components & Plugins	Google Cloud 4D Components & Plugins
GitLab Workflows Pipeline	Health Check Deployment Verification GoLang	NoMethodMetricEnd Check GoLang
DataDog Integration Activity Logging Alert Enablement	Jira Integration Release Versioning	GitLab Package Registry Artifacts

Developer Cycle

- Each Pipeline Run produces artifacts explaining details of the failure or details of success.

- Compile any branch.

- Download the compiled artifact.
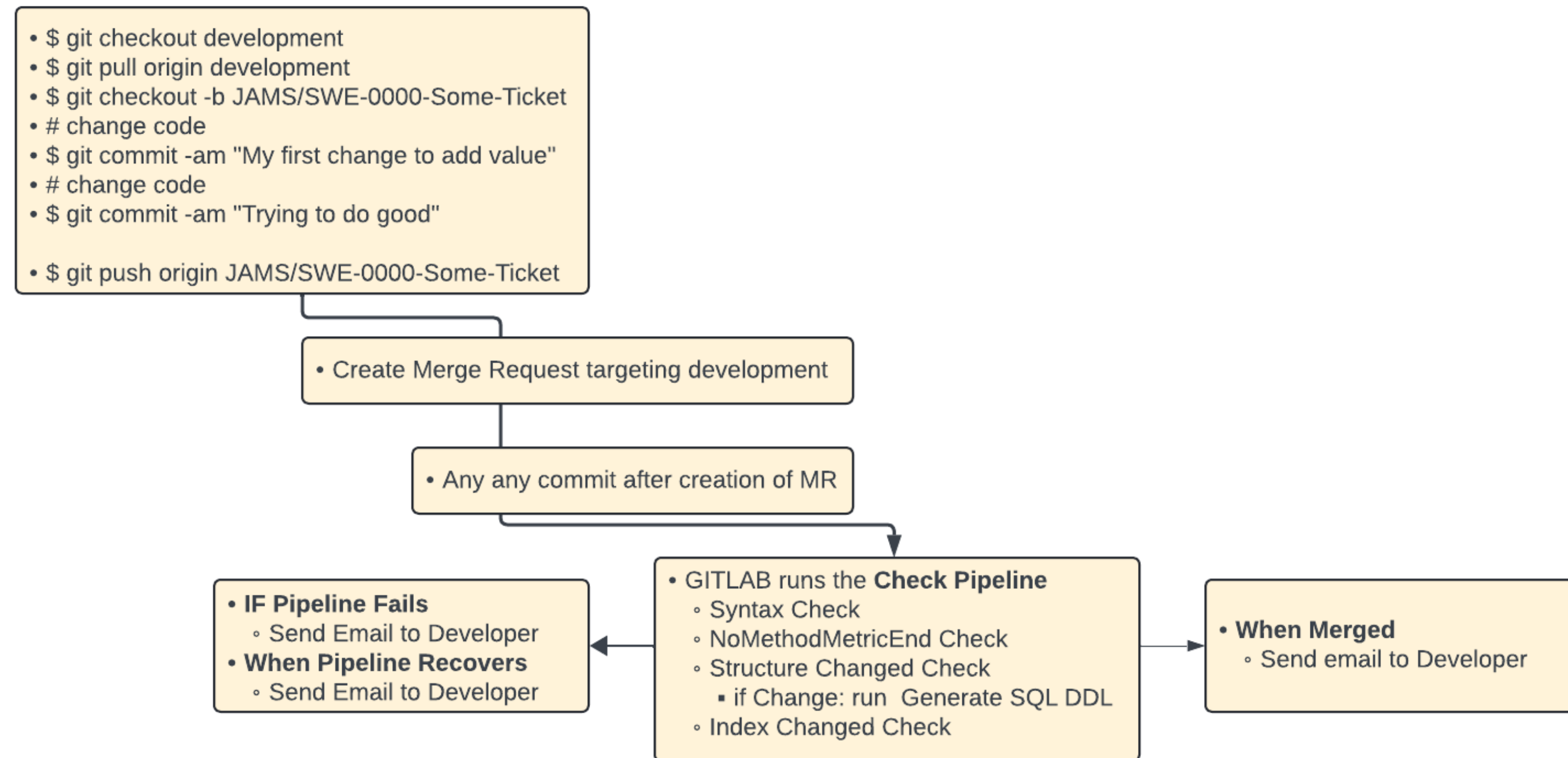
Deliverables

Symphony

- Developer GitLab Workflow
  - Feature Branch
  - Merge Request
  - Pipeline Checks
  - Code Review
  - Mandatory Approvals
- 4D App to schedule deploys
- Build Any Branch
- Deploy Any Branch
- Job Artifacts
- Automated Deploys to All 4D Servers
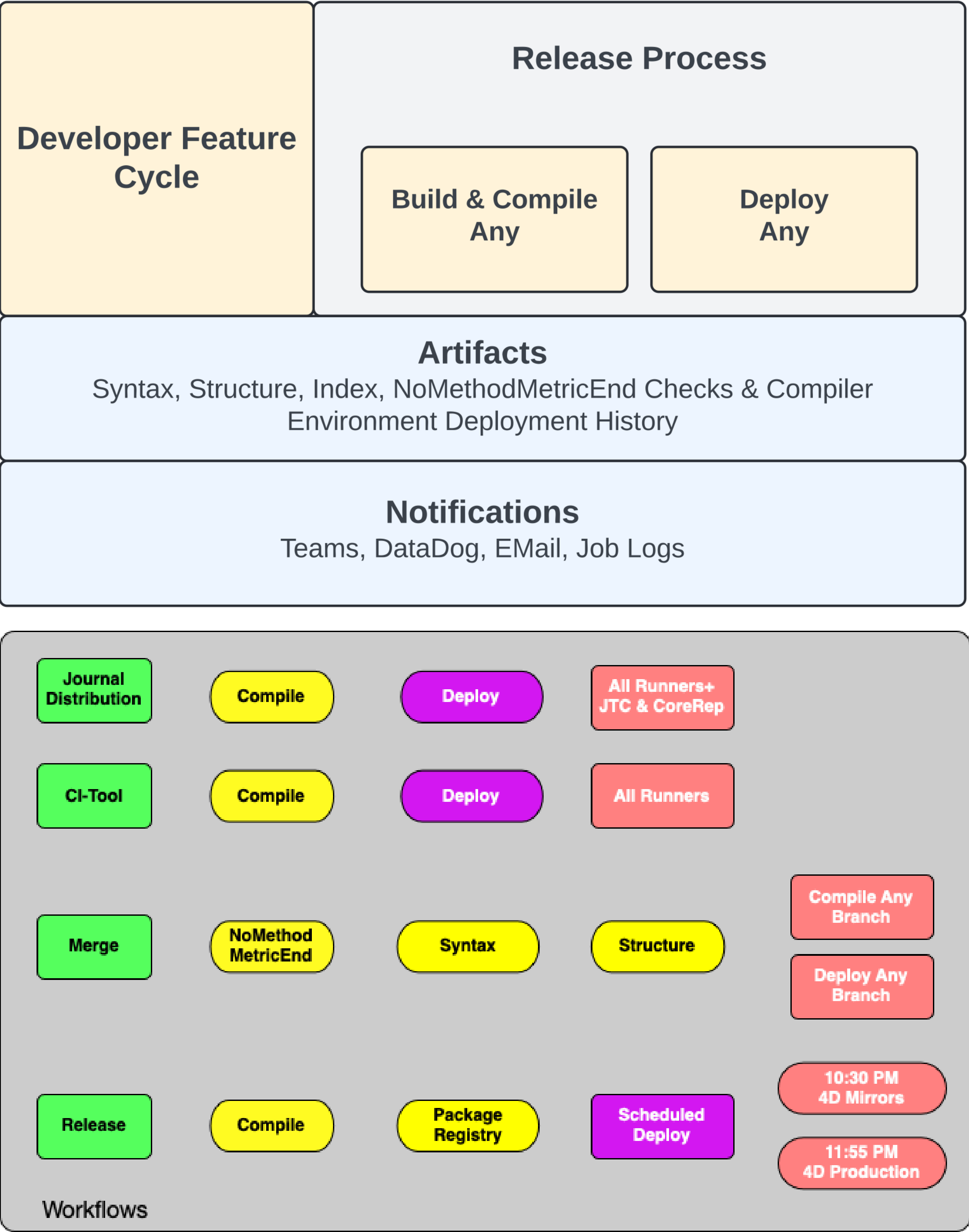
Summary

Impacts

- TIME TO VALUE

- Deploy Daily or On-Demand vs Monthly

- No code freezes

- Minimum of 25% Increase in Developer Productivity

- Minimum of 50% increase in QA Productivity

Jimi Hendrix by Leon Devenice canvas art print

100 %

Sweetwater Team Effort