The LIQUID SOFTWARE Company

Introduction to JFrog Platform

Carlos Moya | Senior Solutions Engineer | cmoya@jfrog.com

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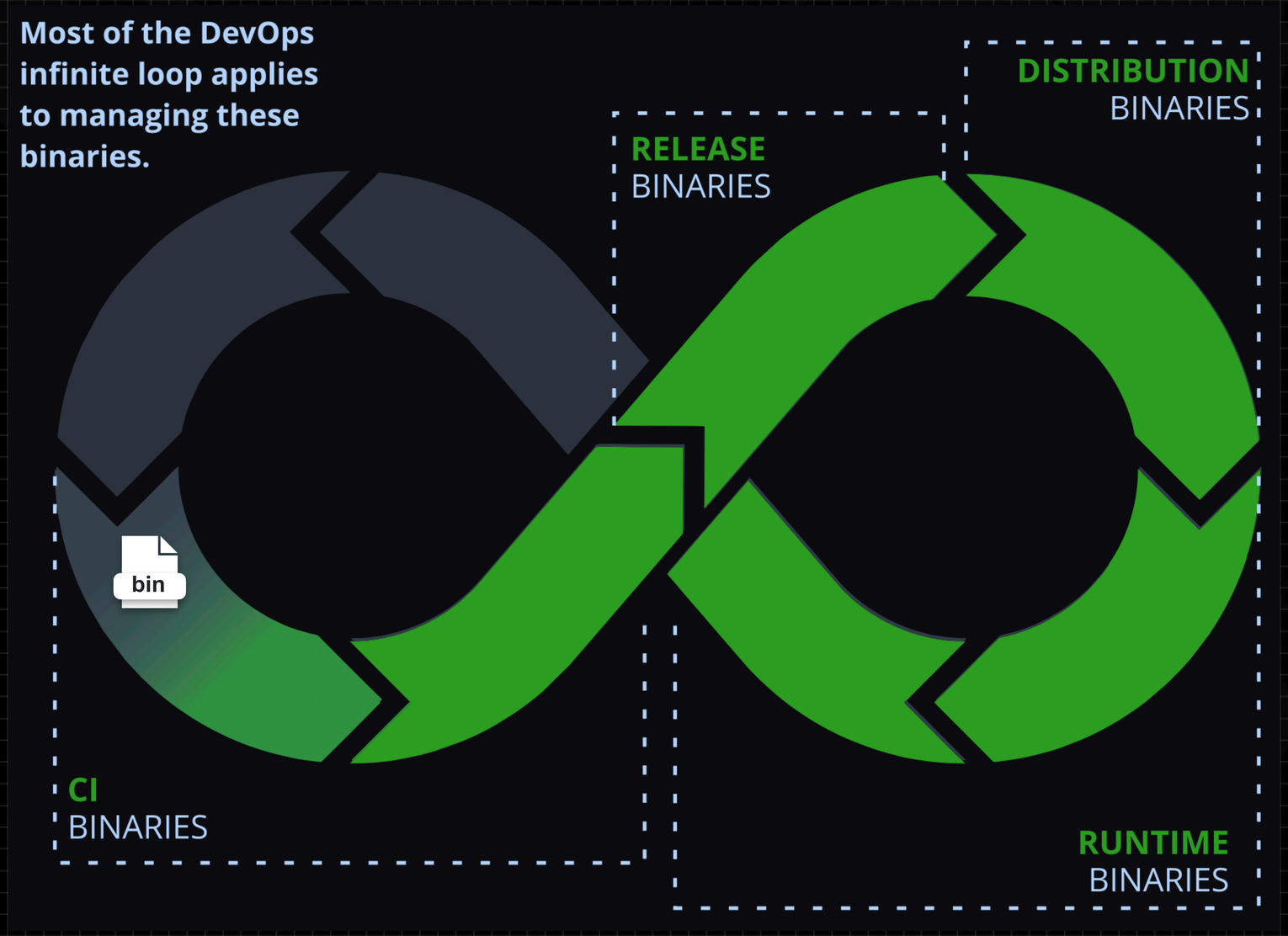
A Bit Of Context

A binary-centric approach to DevOps



Overview of the JFrog Platform

BUILD & TEST → RELEASE → DEPLOY

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Addressing common challenges with Artifactory

Basic

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Software
Company

Single Development Team, single location

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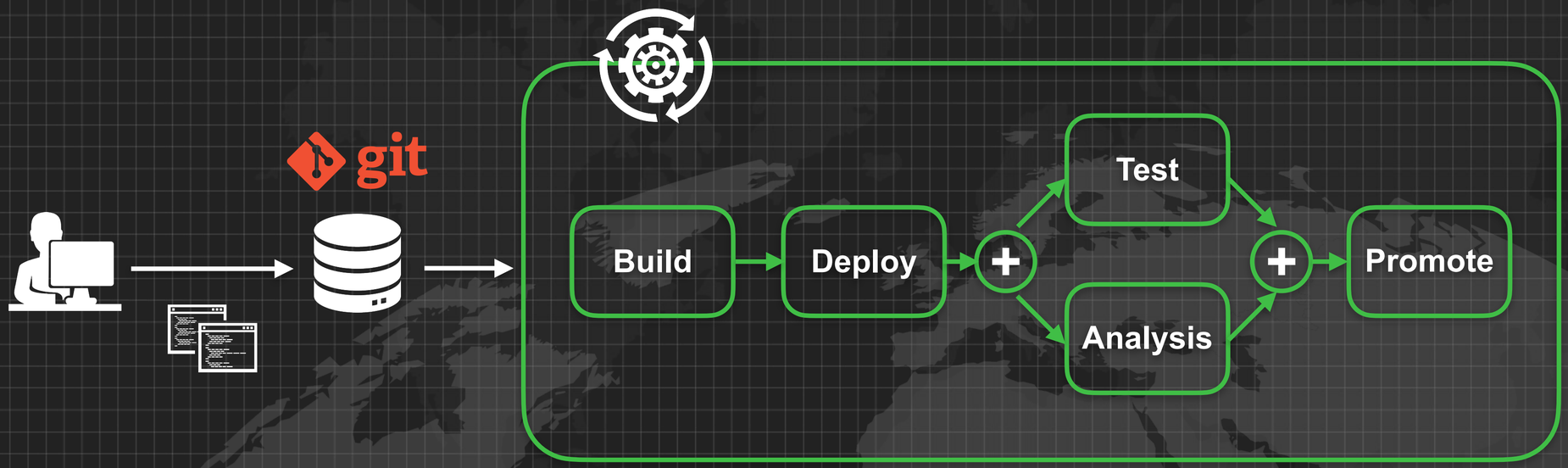
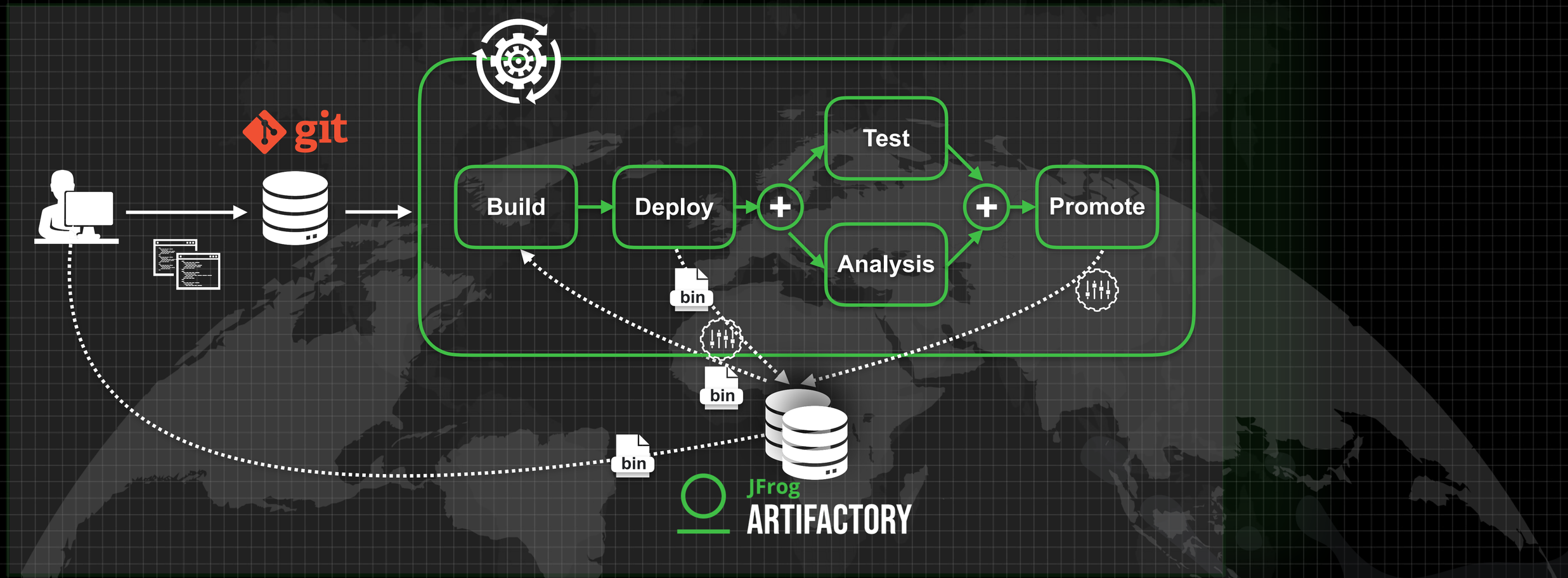
Single Development Team, single location



JFrog
The Liquid Software Company

Single Development Team, single location



JFrog
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Key features

- Checksum based storage
- Integrates with 30+ package managers
- Full metadata for all supported package formats
- REST API, CLI, AQL, User Plugins
- Built in integrations with automation tools for CI/CD
- Local / Remote / Virtual repositories
- Projects

Build Info

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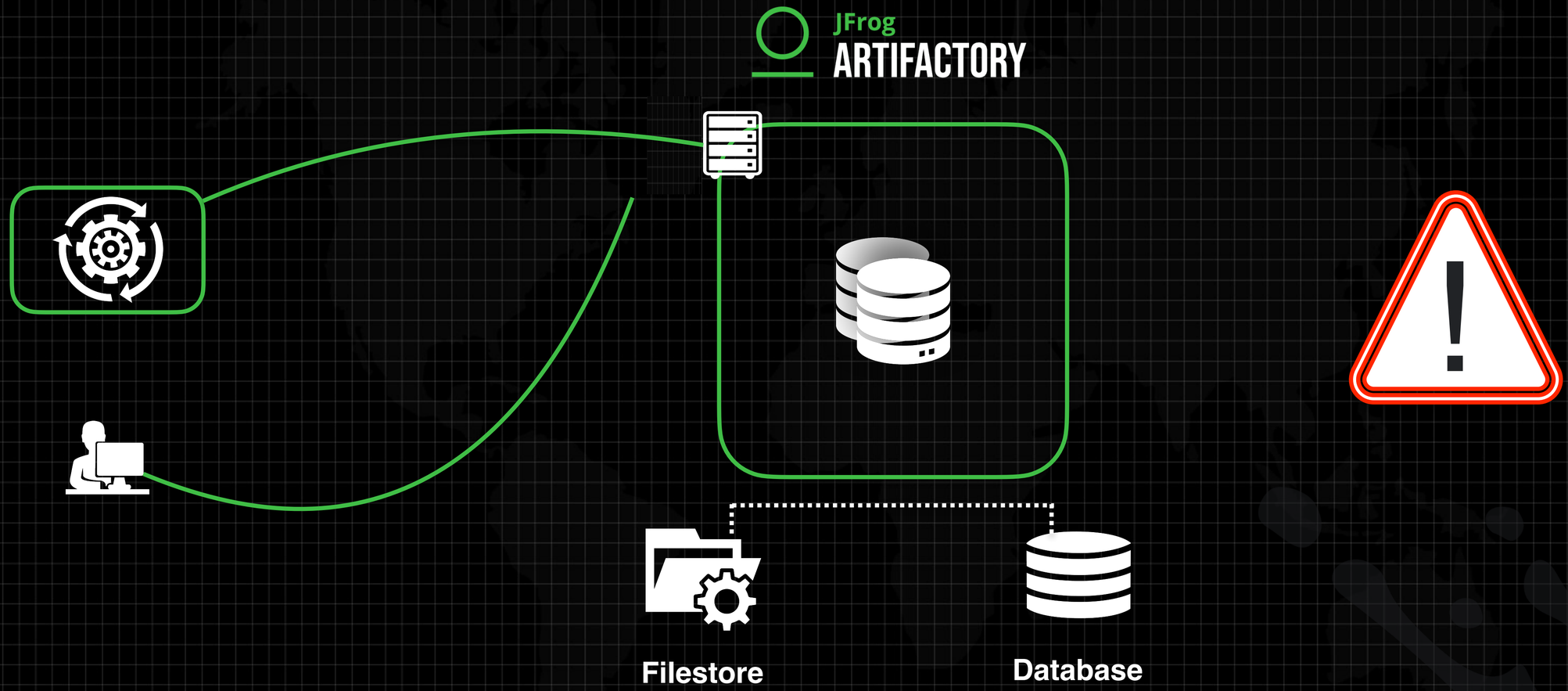
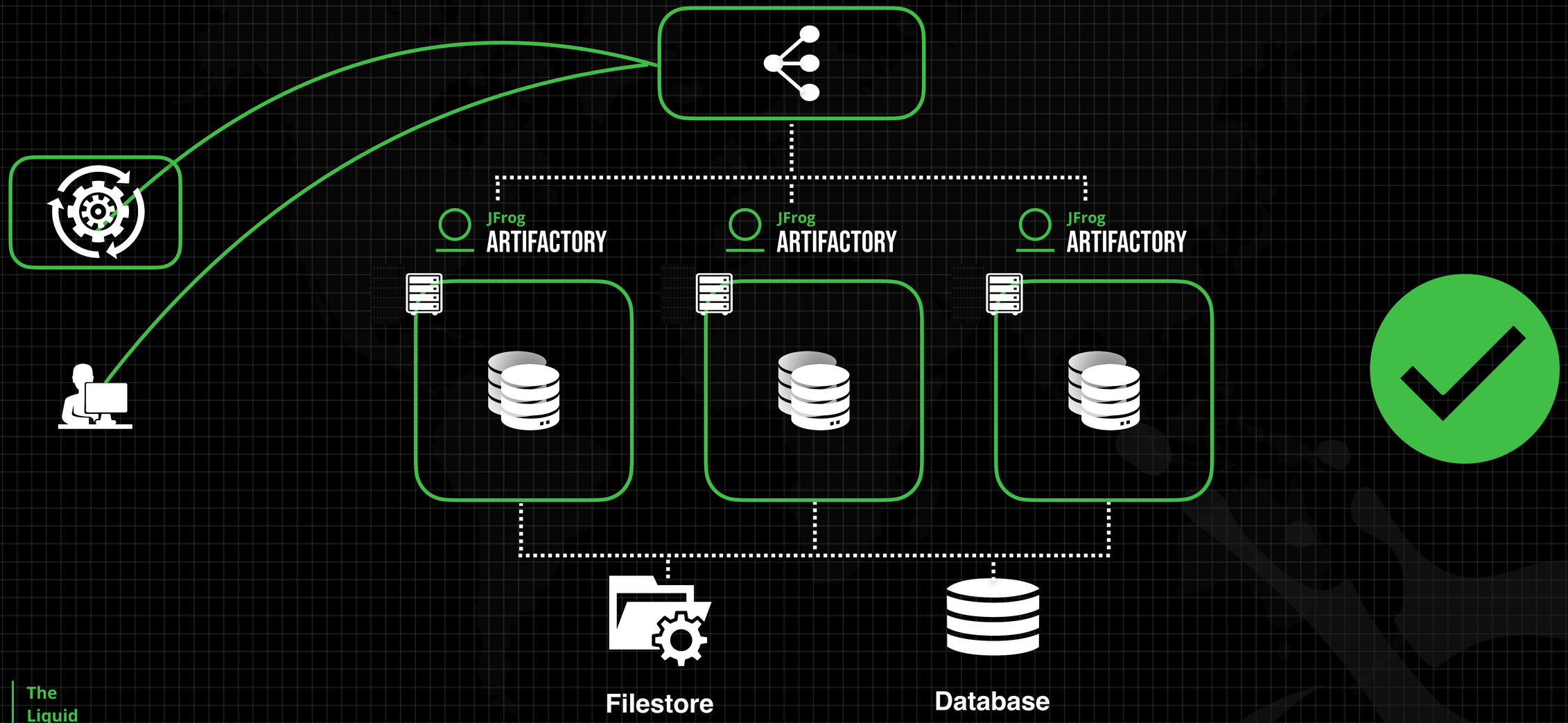
Binary management as critical service



Binary management as critical service



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Key features

- Zero Downtime Upgrades| Resiliency | Performance
- Read and Write caches
- Filestore sharding
- Cloud storage support

Advanced

Many Development Teams, spread across the globe

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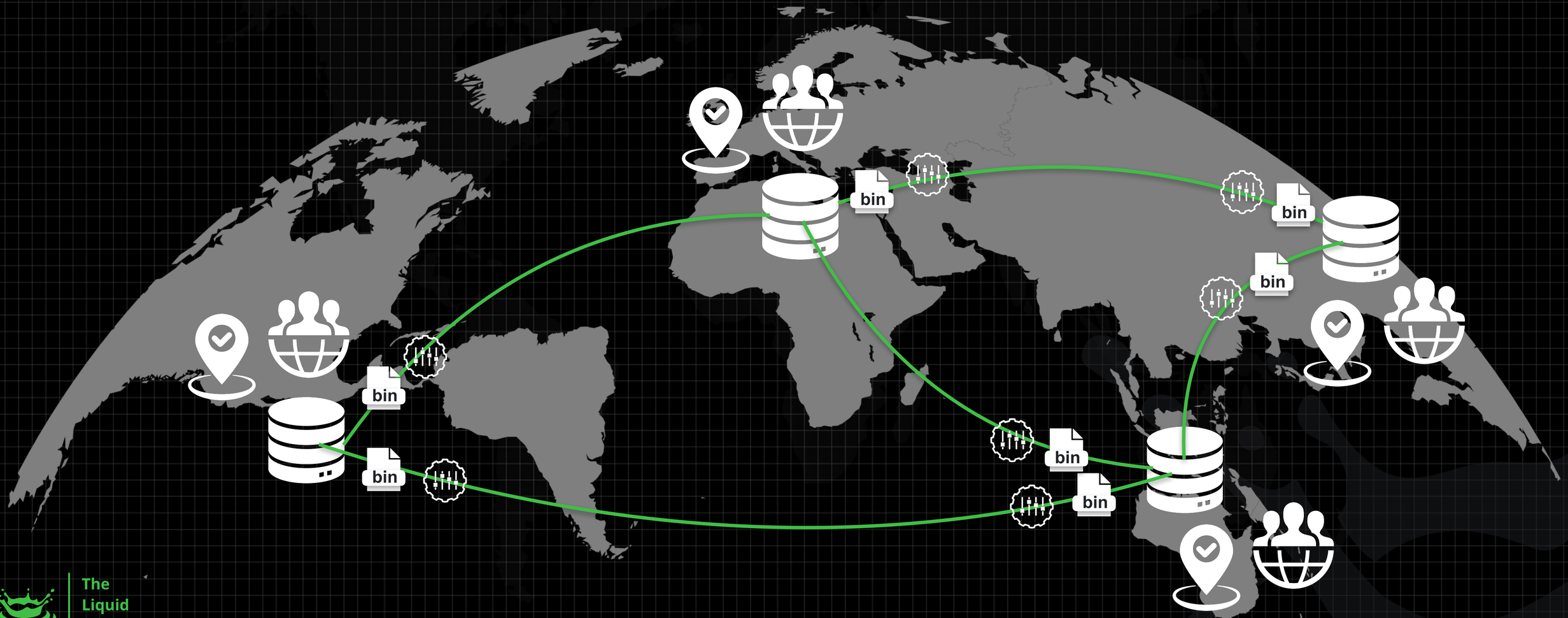
Many Development Teams, spread across the globe



JFrog
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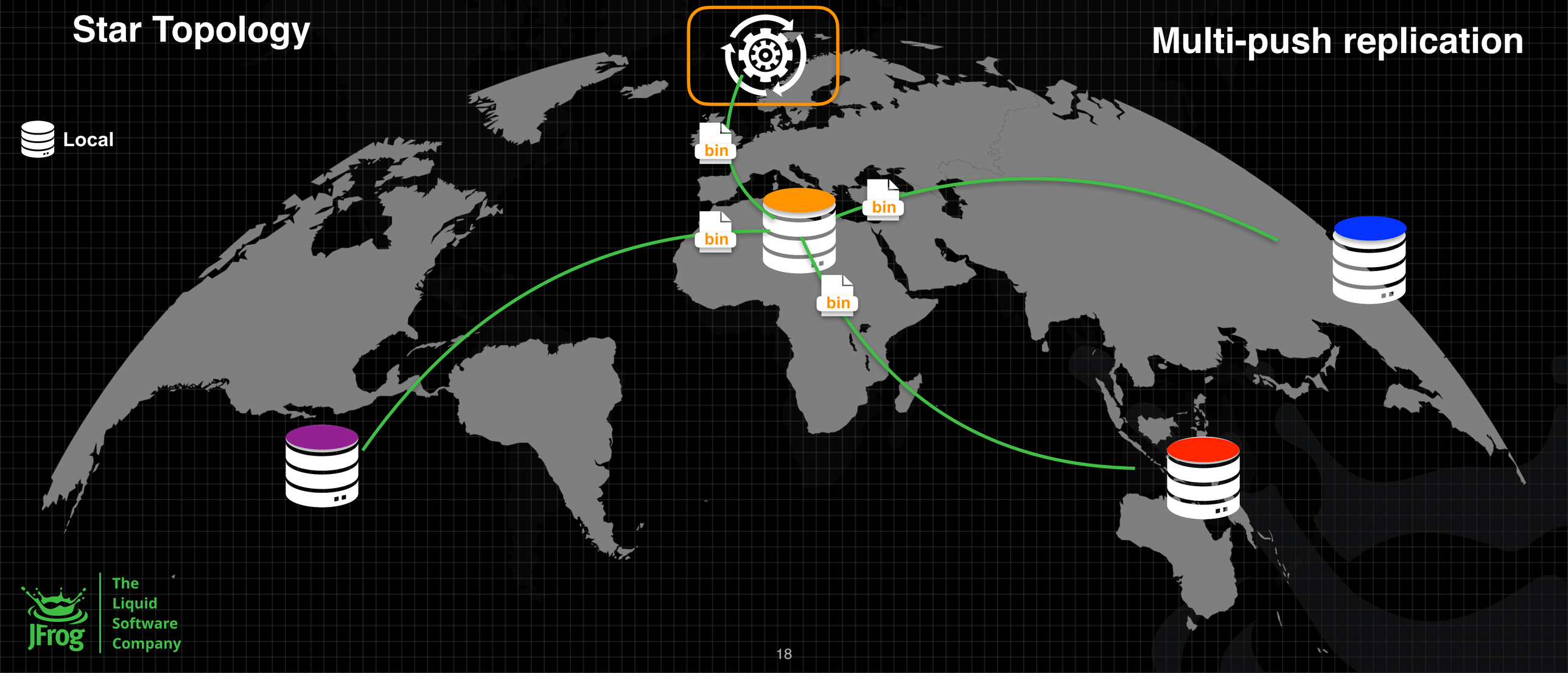
Many Development Teams, spread across the globe

One central CI / CD Server

Star Topology

Multi-push replication



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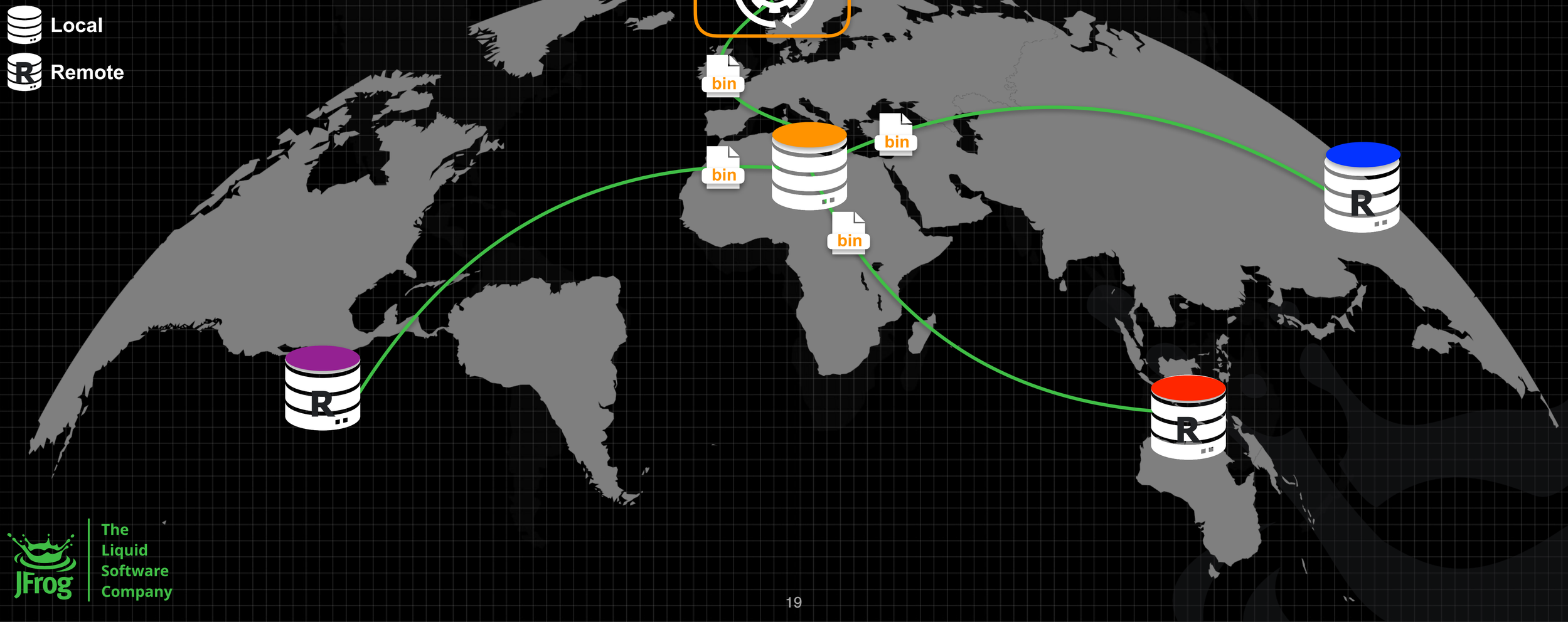
Many Development Teams, spread across the globe

One central CI / CD Server

Star Topology

Pull replication



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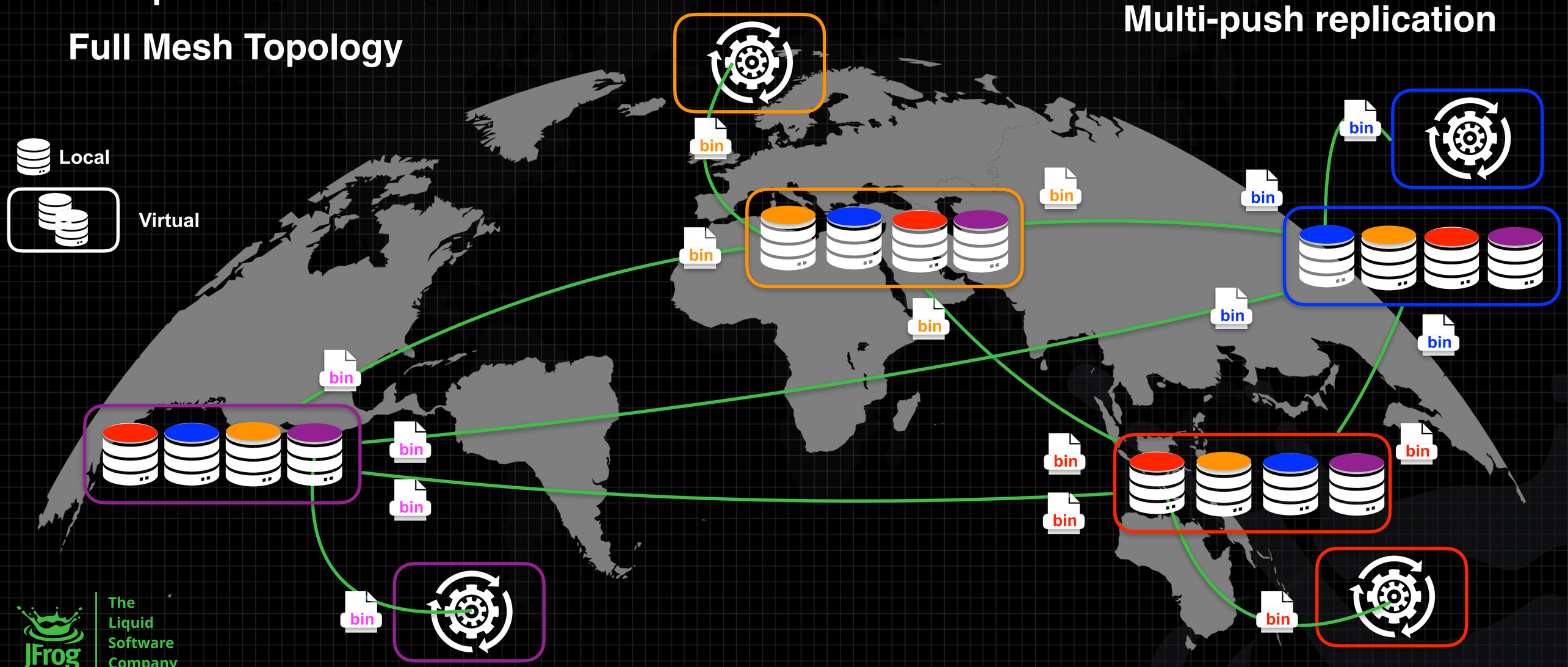
Many Development Teams, spread across the globe

Multiple CI servers

Full Mesh Topology

Multi-push replication



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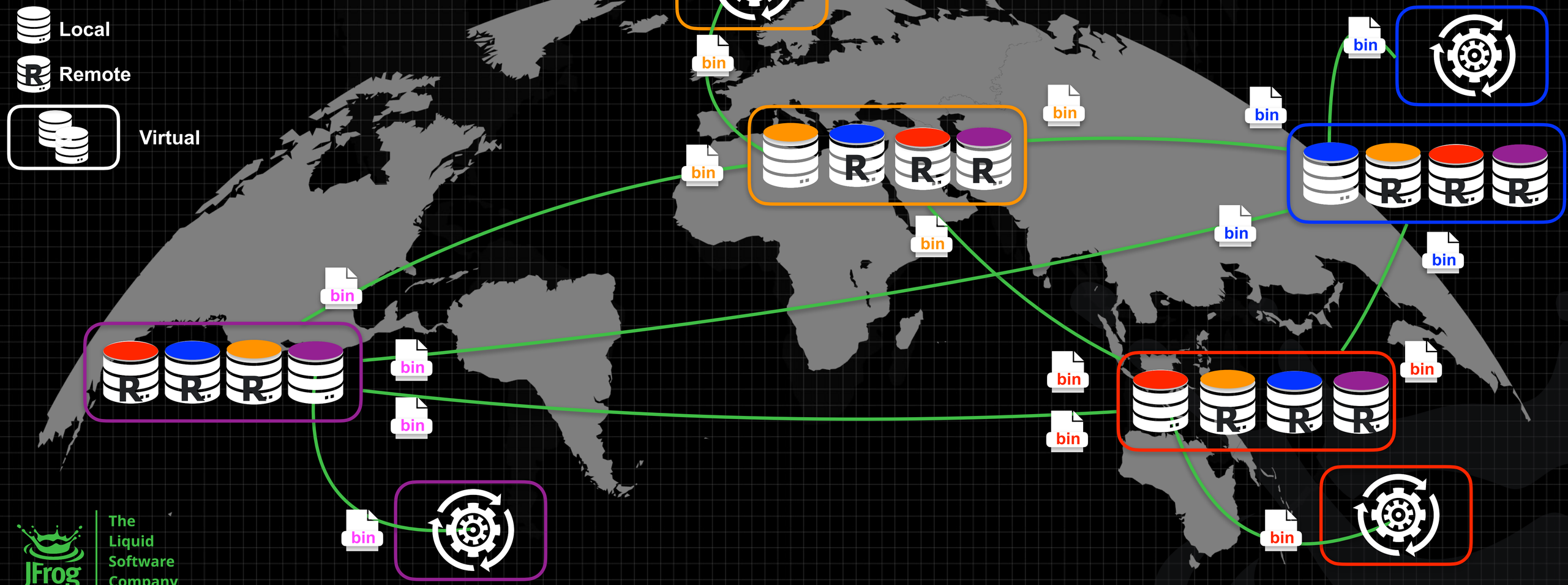
Many Development Teams, spread across the globe

Multiple CI servers

Full Mesh Topology

Pull replication



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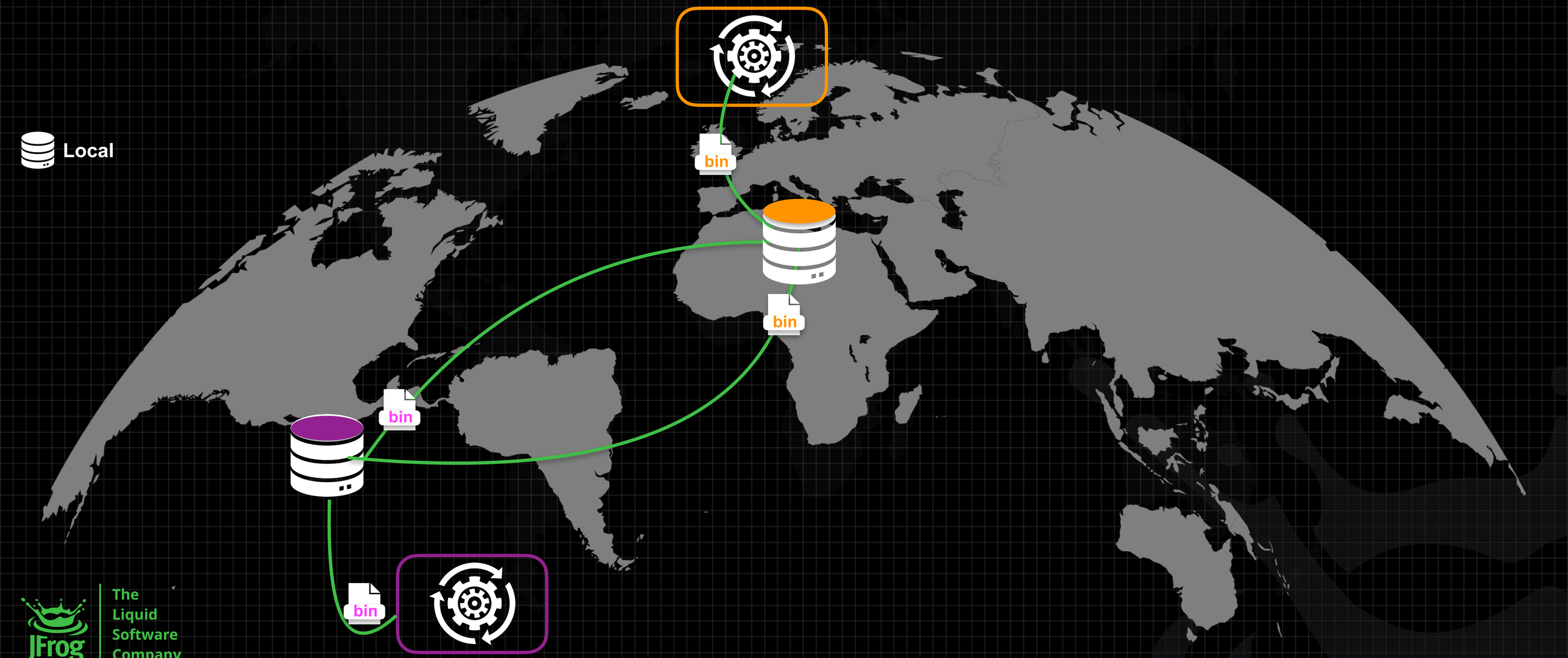
Many Development Teams, spread across the globe

Federated repositories



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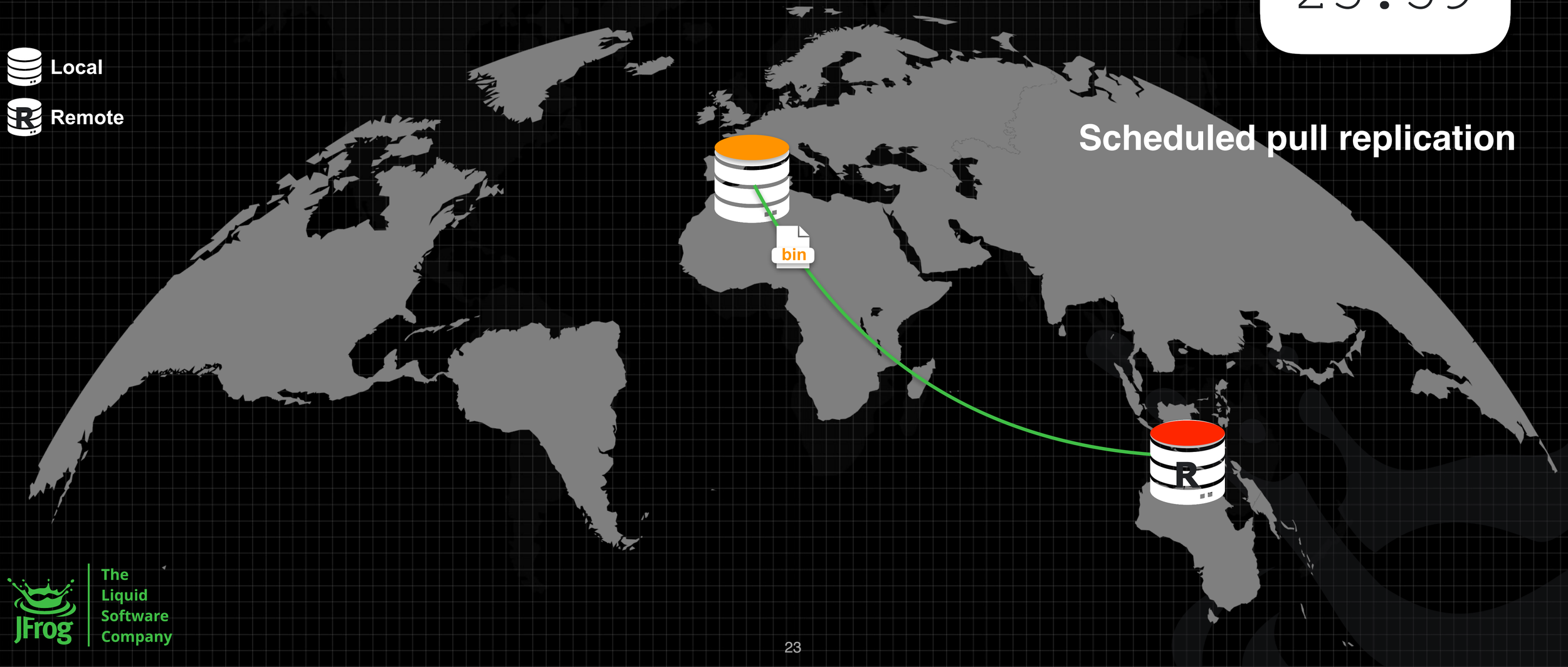
Many Development Teams, spread across the globe

Limited bandwidth



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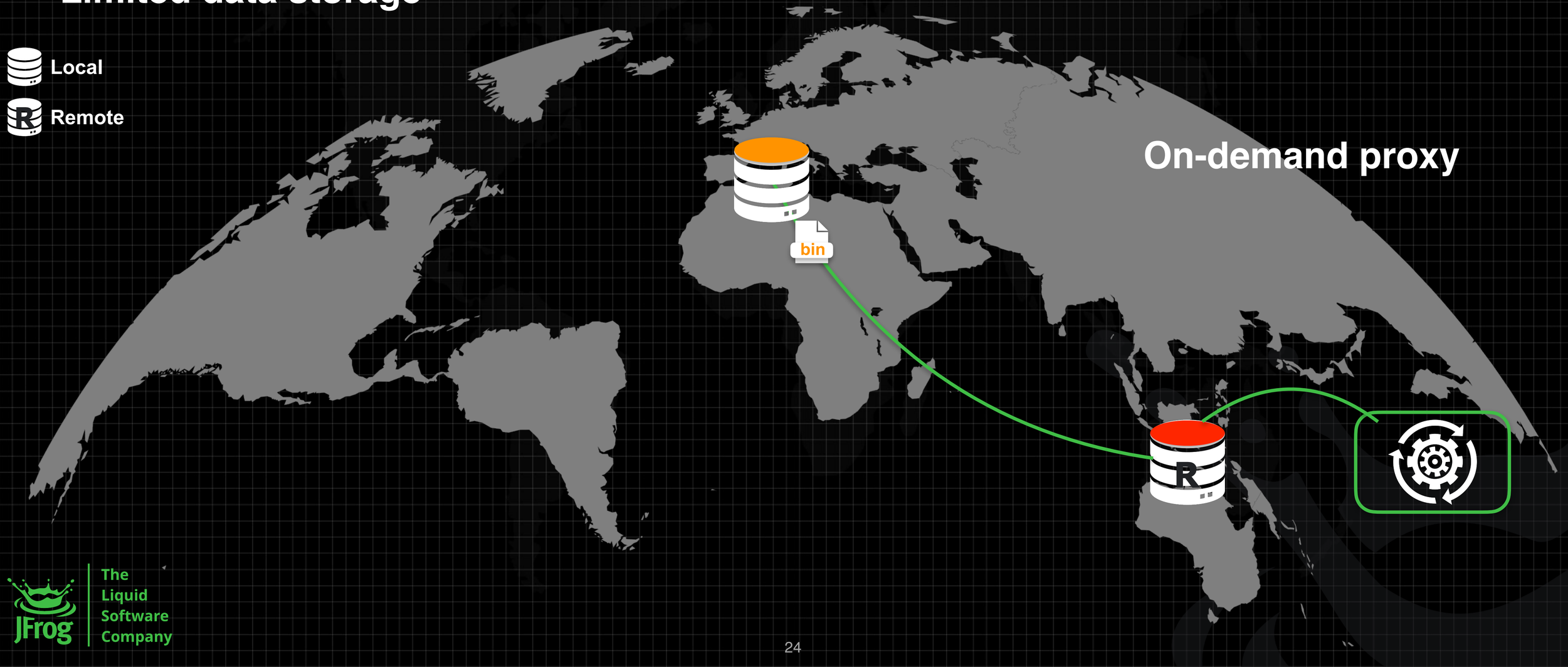
Many Development Teams, spread across the globe

Limited data transfer
Limited data storage



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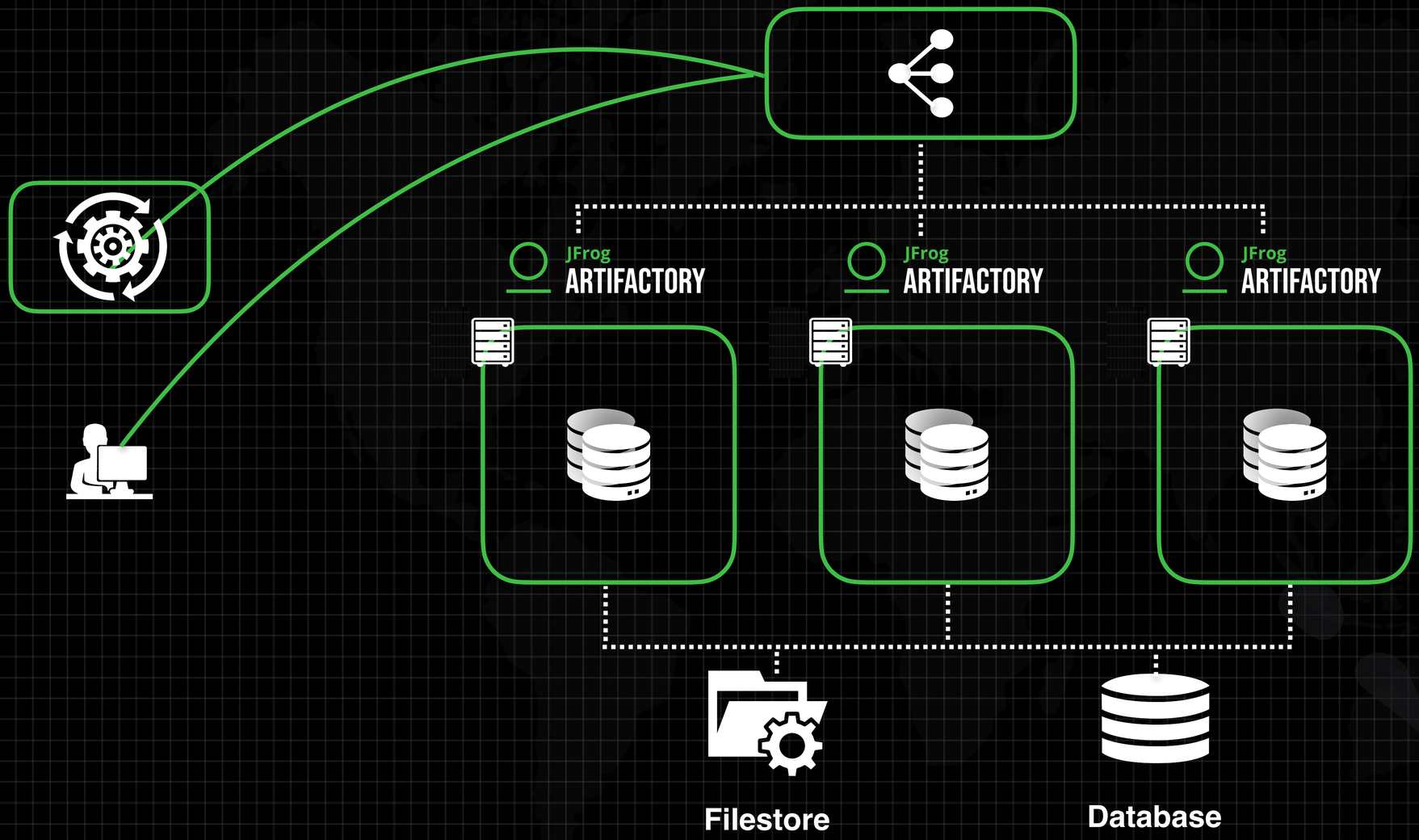

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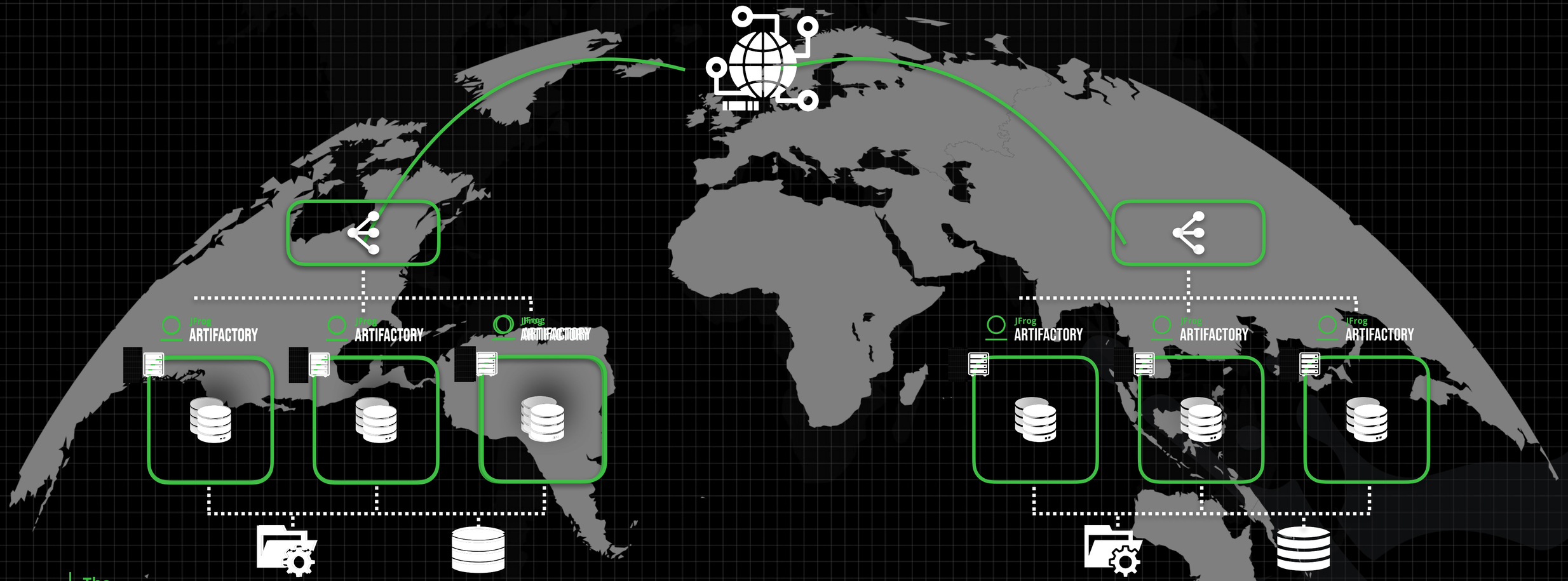
Many Development Teams, spread across the globe

Geo DNS Architecture



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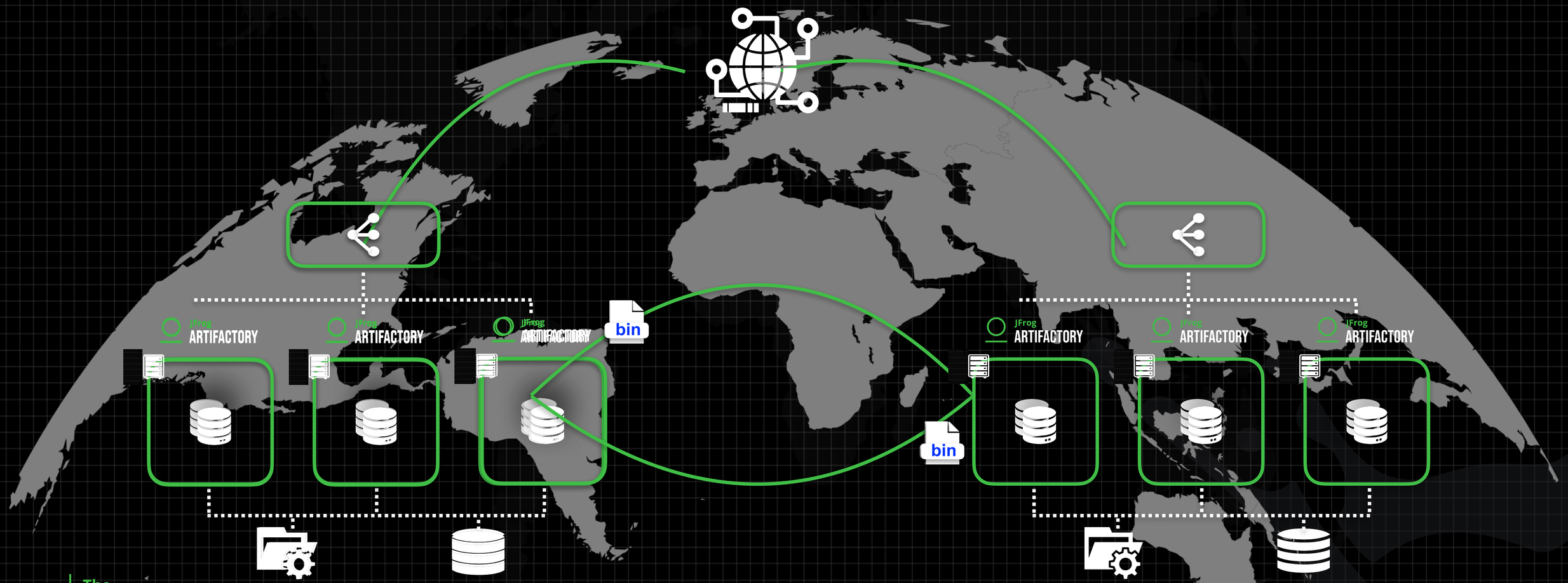
Many Development Teams, spread across the globe

Geo DNS Architecture



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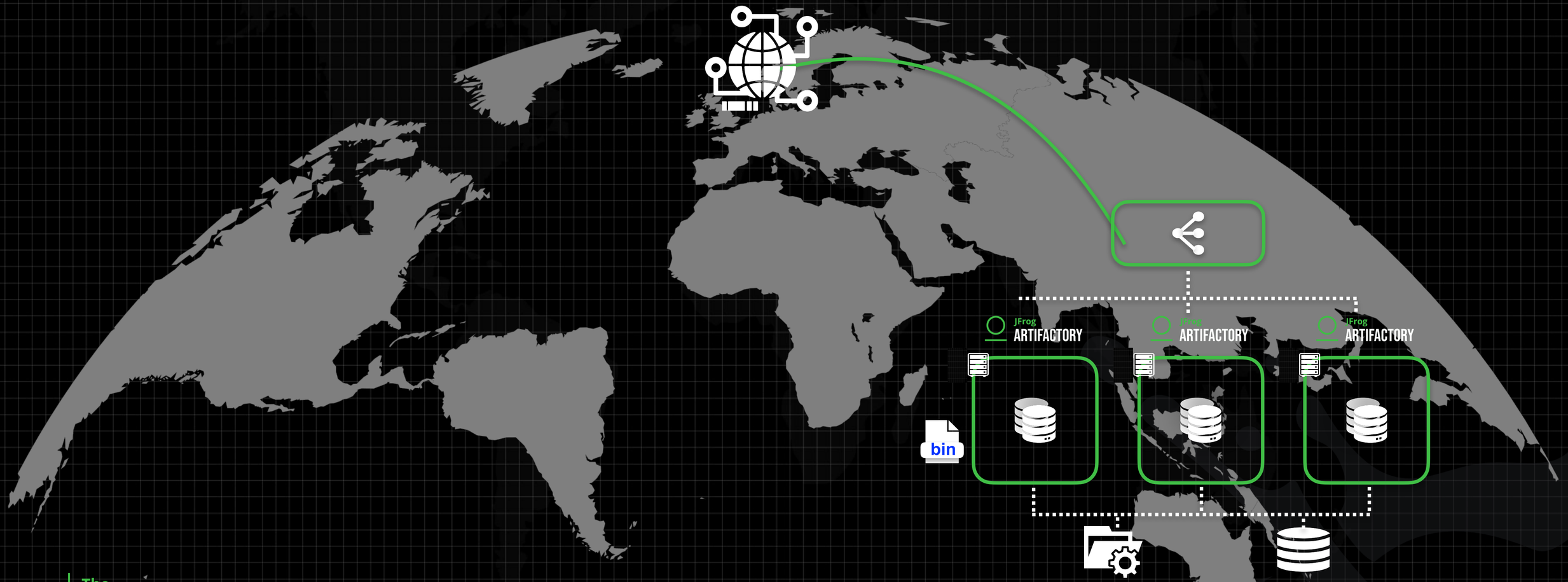
Many Development Teams, spread across the globe

Geo DNS Architecture



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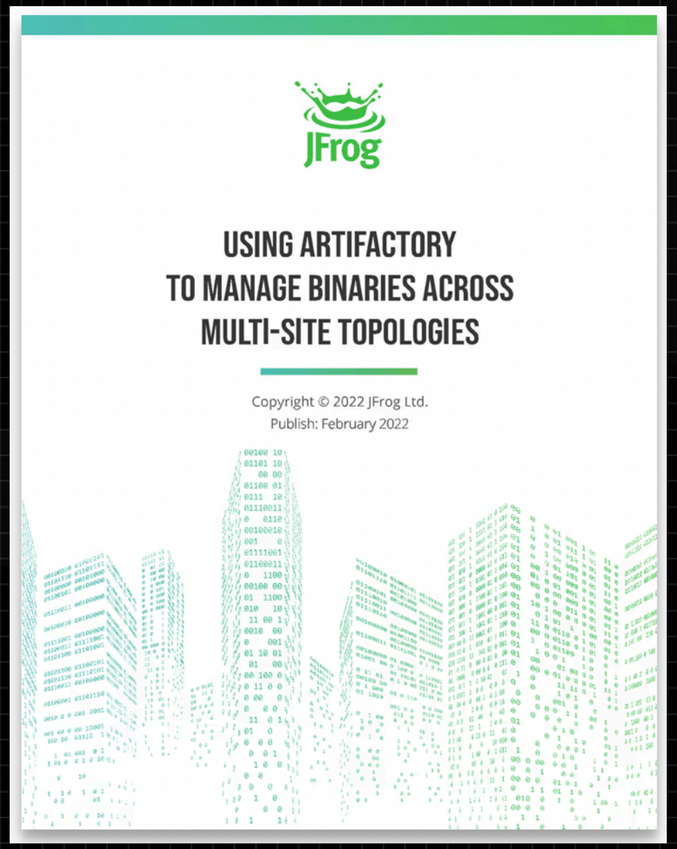
Useful links

https://jfrog.com/whitepaper/replication-using-artifactory-to-manage-binaries-across-multi-site-topologies/



Securing your binary supply chain with Xray

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Introduction Xray

Overview of the JFrog Platform

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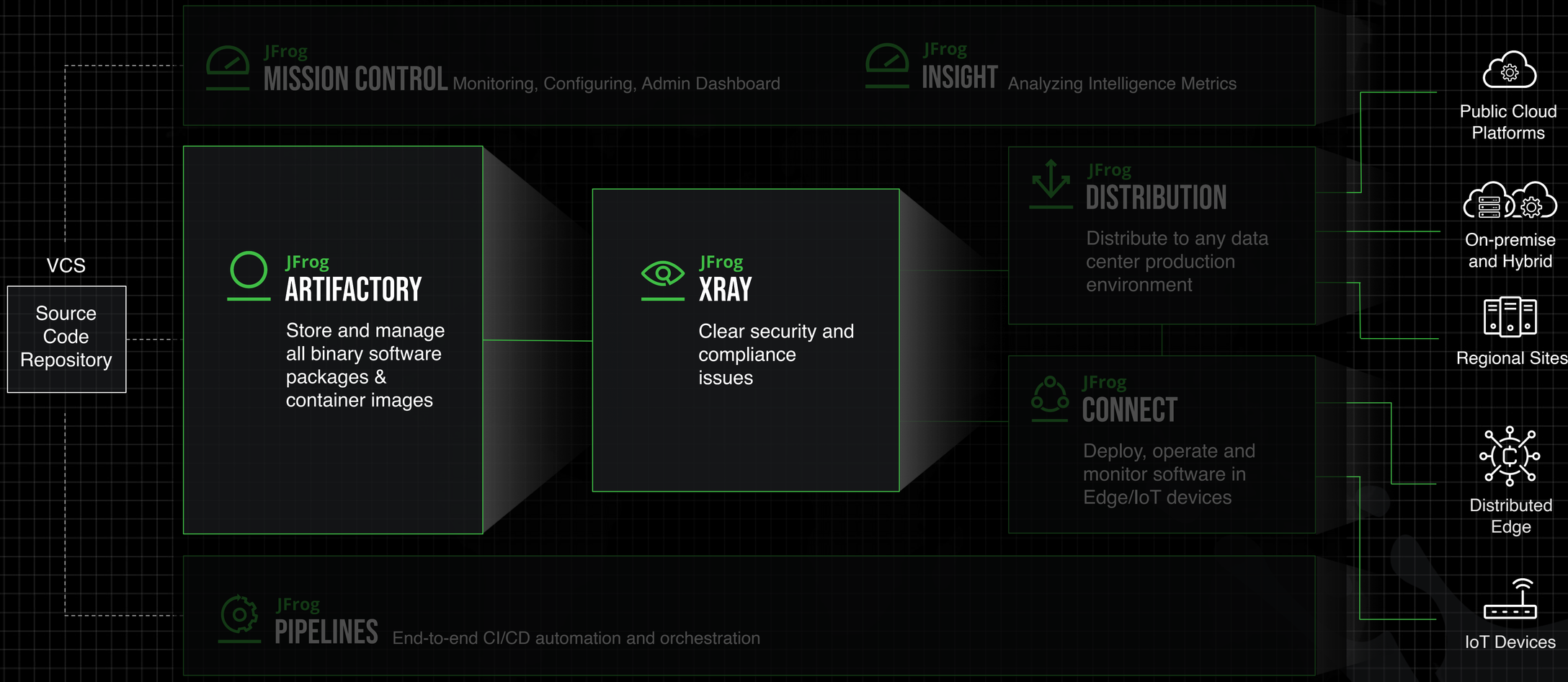
Overview of the JFrog Platform



BUILD & TEST | RELEASE | DEPLOY

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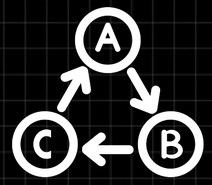
Source: Anchore report

What is the need

> In an average application, **85 -90%** of the codebase is open source

> **49%** of codebases analysed had at least one component with a high-risk vulnerability

> **90%** of applications used at least one open source component that was out-of-date by four or more years, or was abandoned



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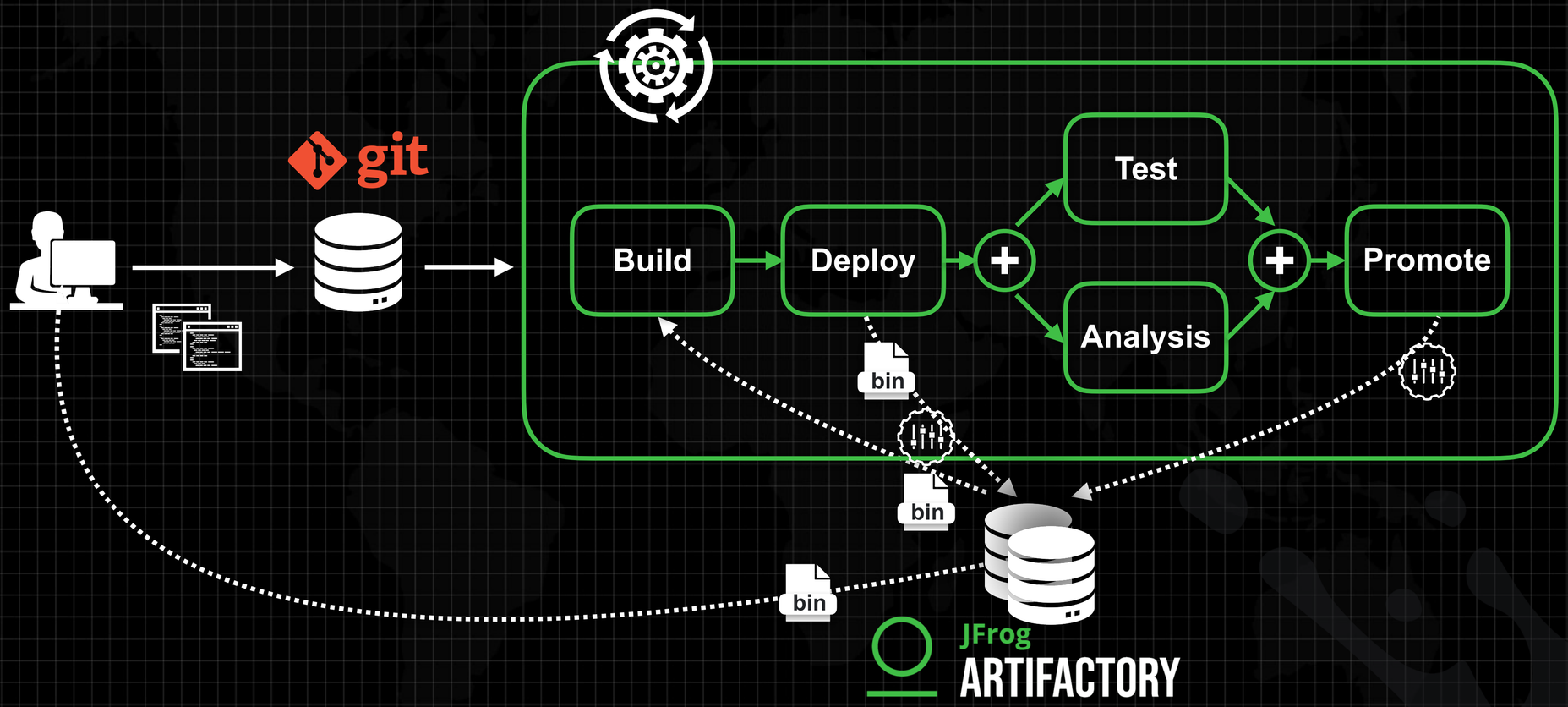
What is the need



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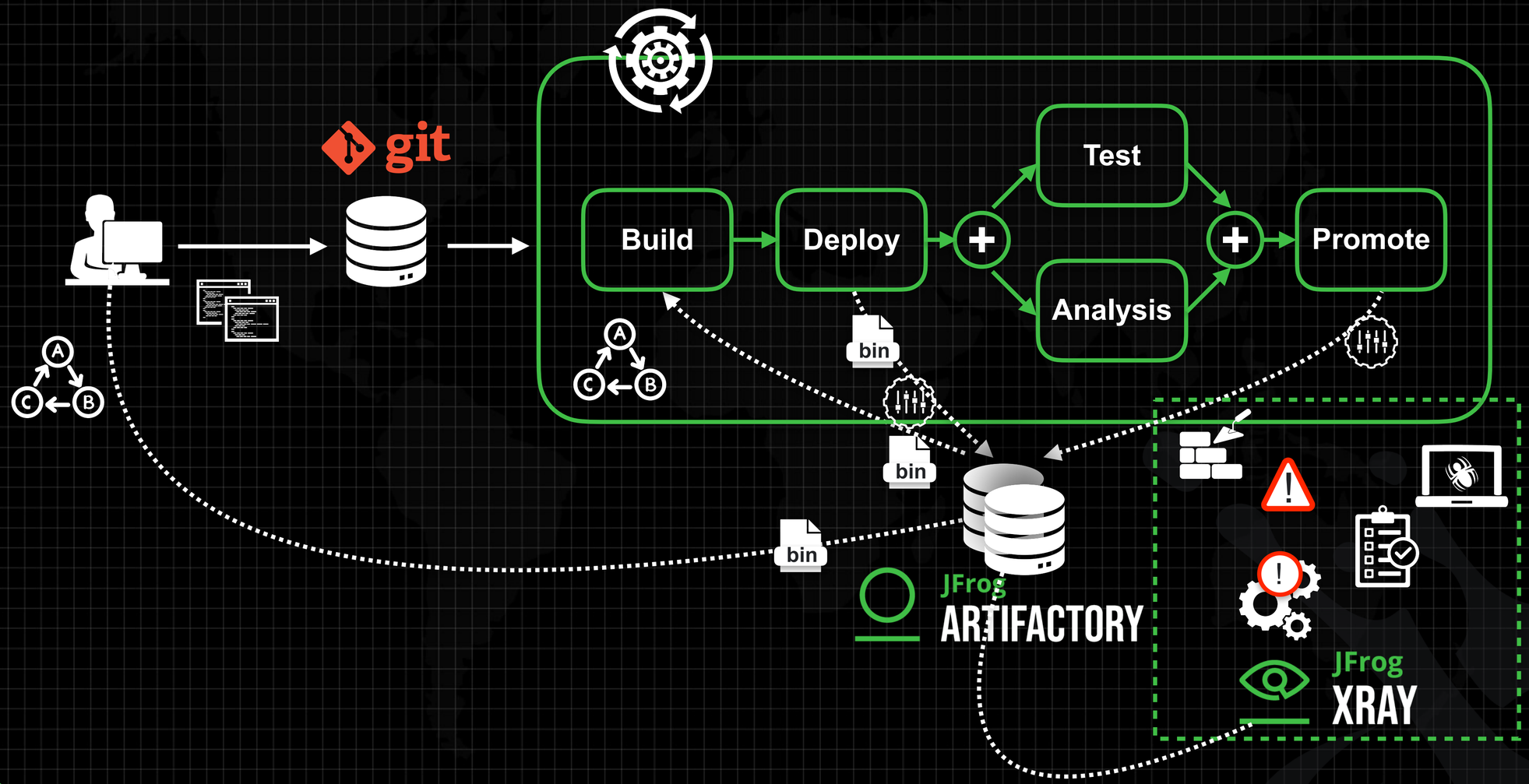
What is the need



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Top Notch Security Research At Your Fingertips

- Certified CNA
- In-Depth Research
- Discover and disclose new OSS vulnerabilities
- Analyze novel attack methods
- Help the community and customers with OSS Tools promptly

https://research.jfrog.com/

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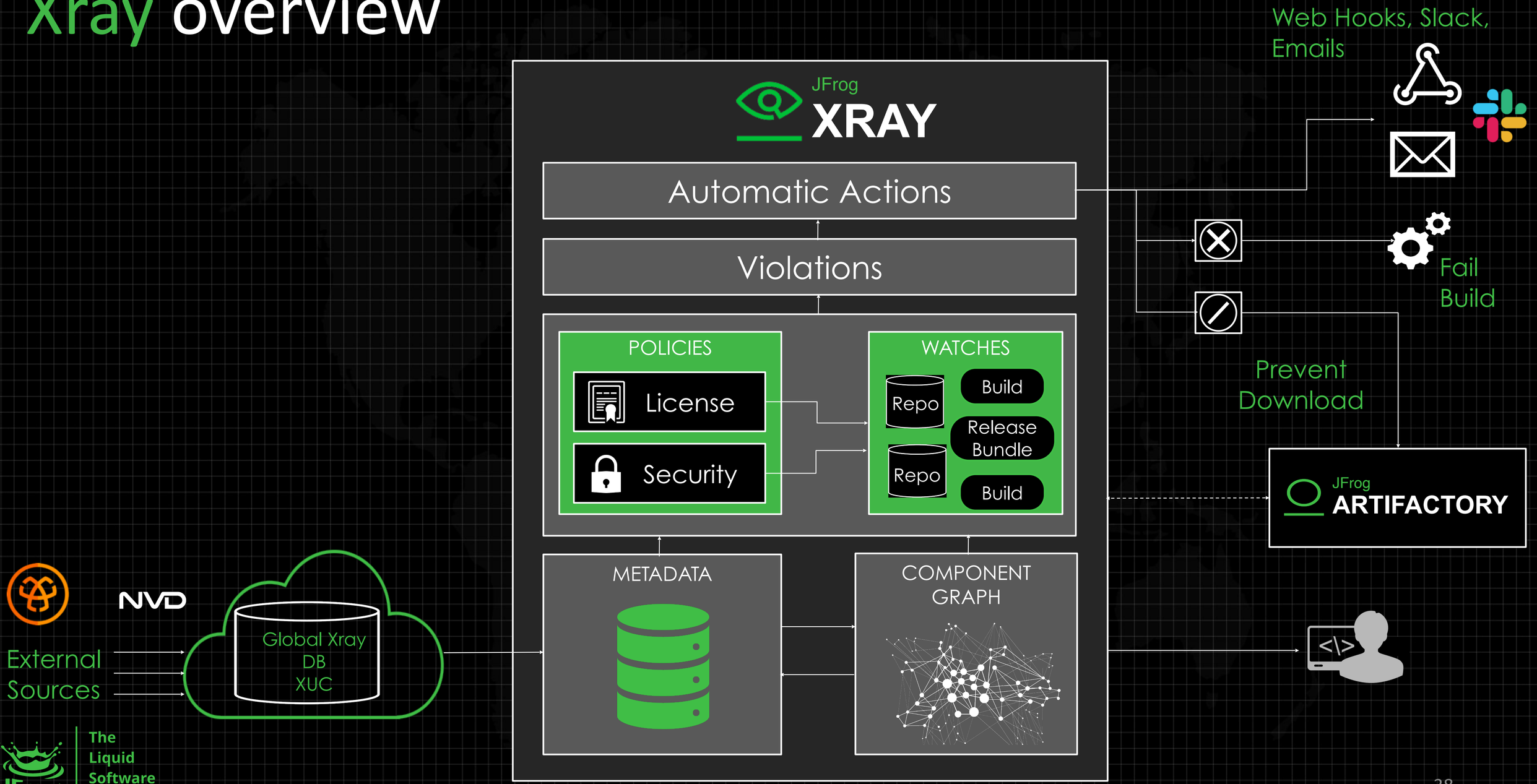
Xray overview



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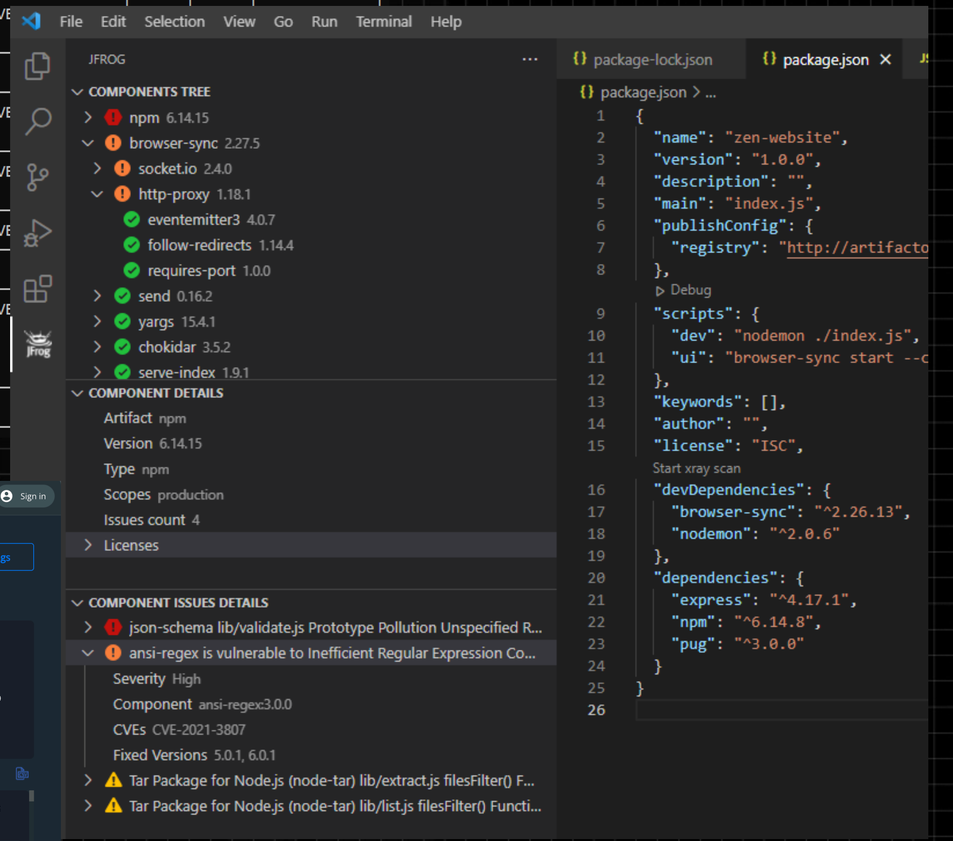
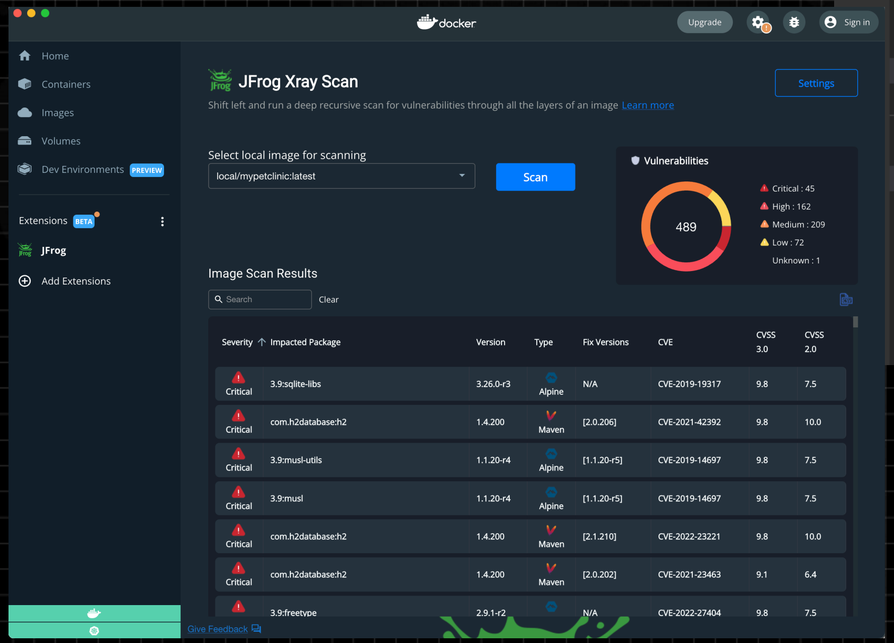
JFrog Xray | Shift left to empower developers

- IntelliJ Idea
- VSCode
- Eclipse
- Visual Studio
- JFrog CLI
- Docker Desktop

SEVERITY	IMPACTED PACKAGE	IMPACTED PACKAGE VERSION	TYPE	FIXED VERSIONS	COMPONENT	COMPONENT VERSION	CVE	CVSS V2	CVSS V3	ISSUE ID
Critical	json-schema	0.2.3	npm	[0.4.0]	npm	6.14.15	CVE			
High	http-proxy	1.18.1	npm	(,0.0.0)	browser-sync	2.27.5				
High	ansi-regex	3.0.0	npm	[5.0.1] [6.0.1]	npm	6.14.15	CVE			
High	ansi-regex	4.1.0	npm	[5.0.1] [6.0.1]	npm	6.14.15	CVE			
High	engine.io	3.5.0	npm	[4.0.0]	browser-sync	2.27.5	CVE			
Medium	tar	4.4.19	npm	[6.1.4]	npm	6.14.15				
Medium	debug	4.1.1	npm	[4.3.1] [3.2.7] [3.1.0] [2.6.9]	browser-sync	2.27.5	CVE			
Medium	tar	4.4.19	npm	[6.1.4]	npm	6.14.15				





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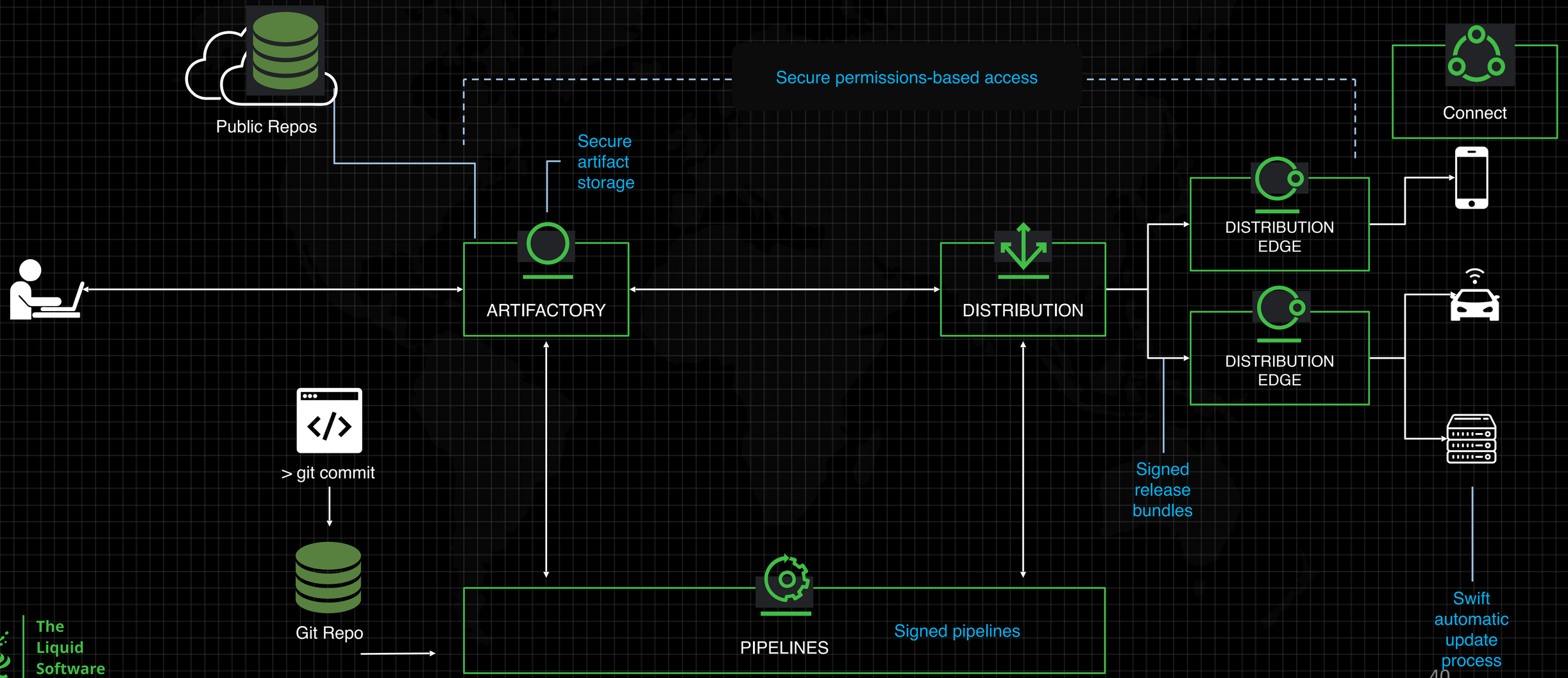
End-to-end security with the JFrog Platform

Continuously securing the software supply chain



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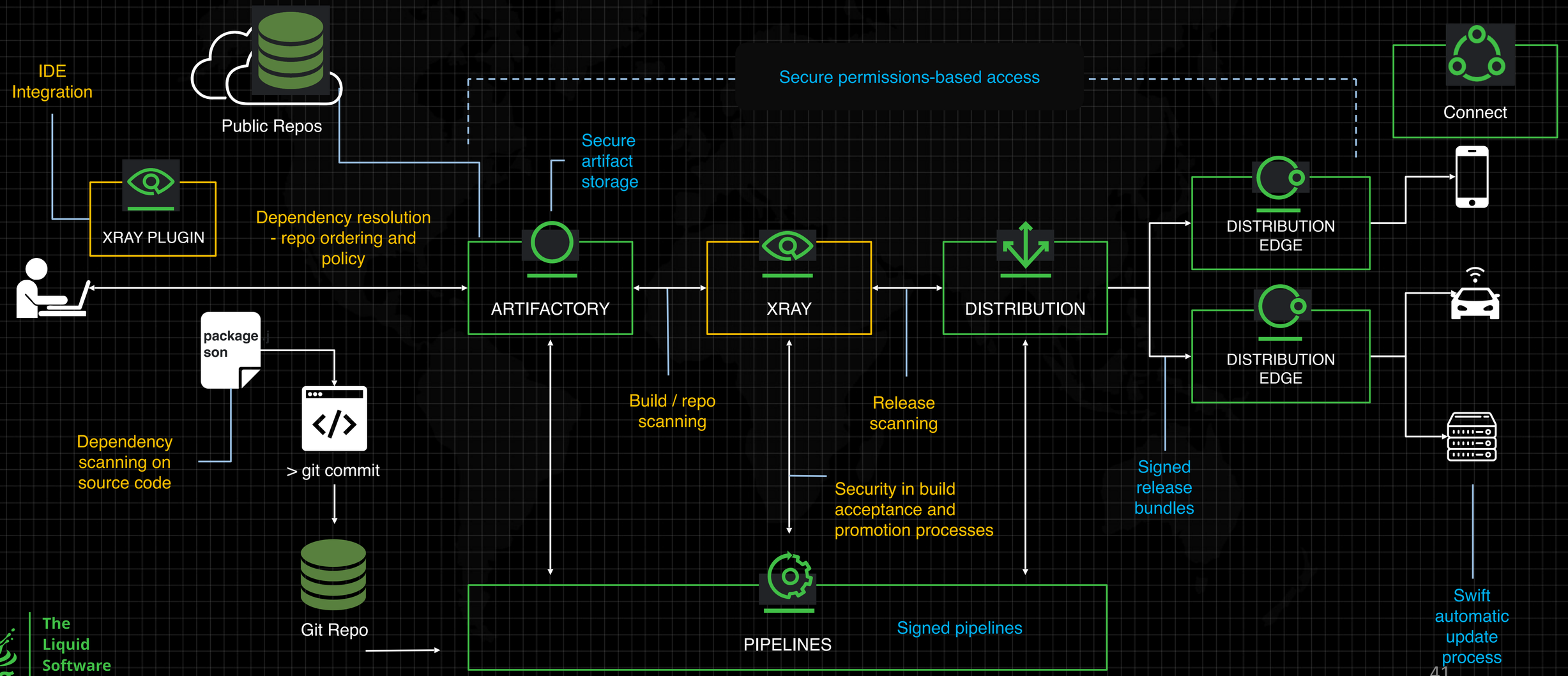

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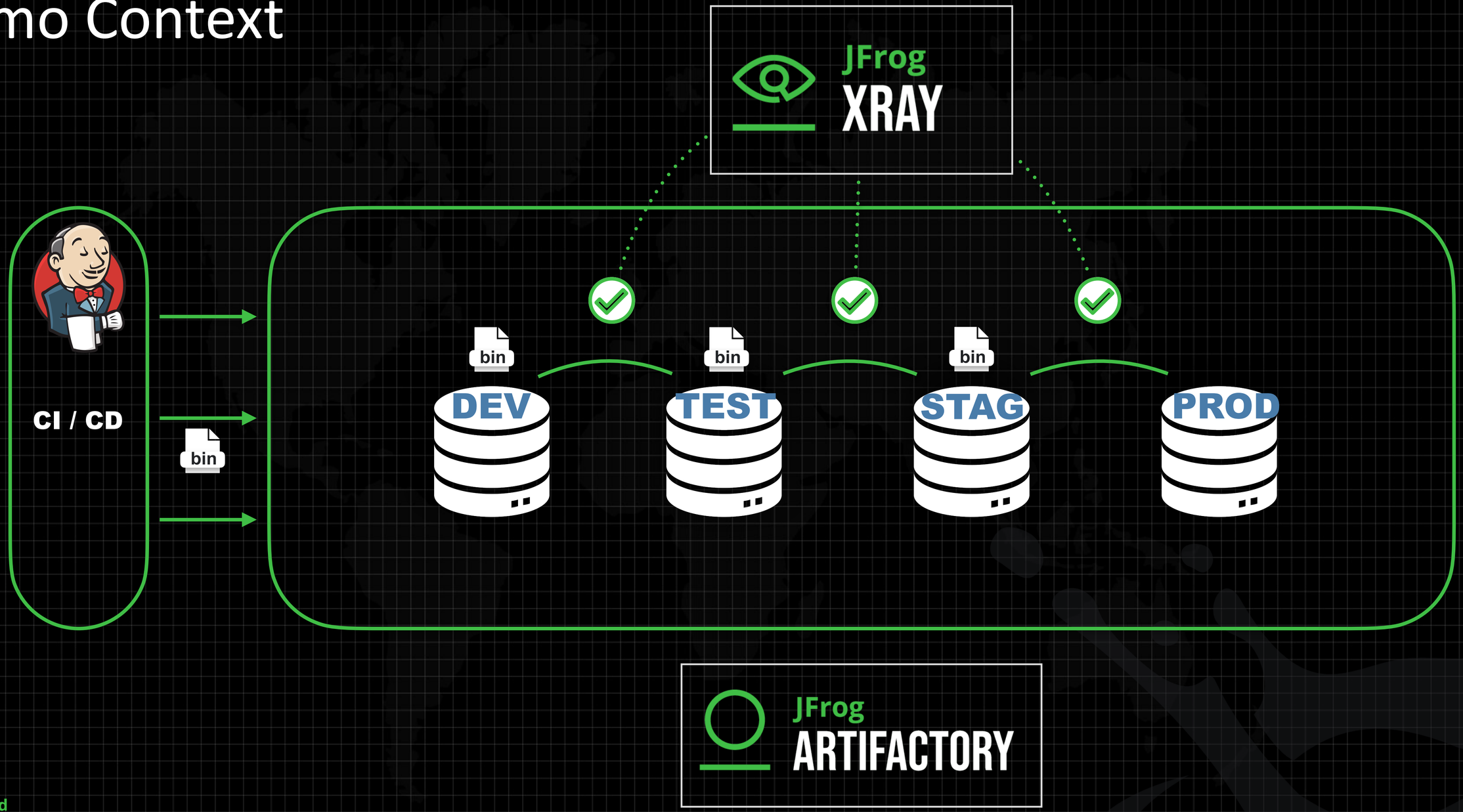
Demo Xray

Demo Context



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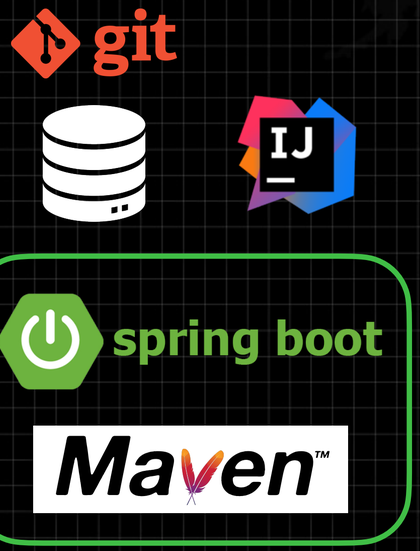
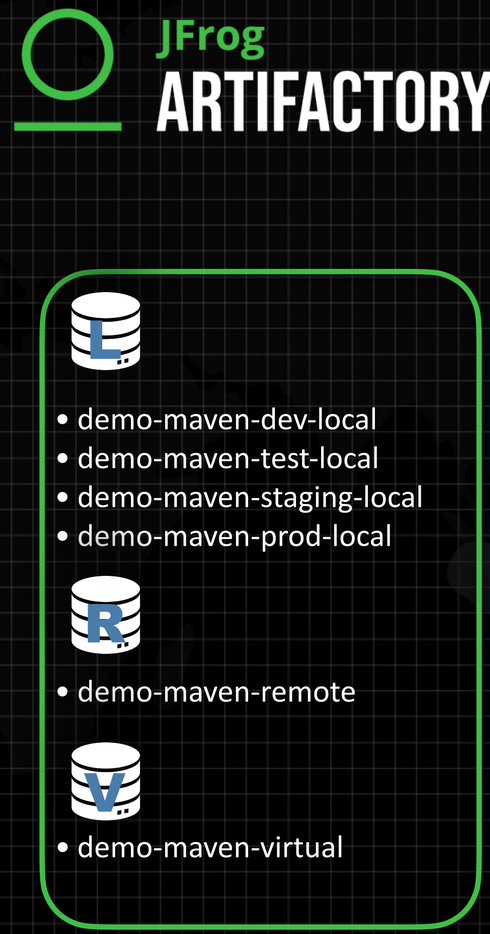
Demo Environment





JFrog XRAY

BuildWatch

GS_SPRING_BOOT_main_mvn

RepoWatch

demo-maven-prod-local

BuildPolicy

Critical 9<= CVSS <= 10
Generate violation
Fail Build
High 7 <= CVSS < 9
Generate violation

RepoPolicy

Critical 9 <= CVSS < 10
Block download

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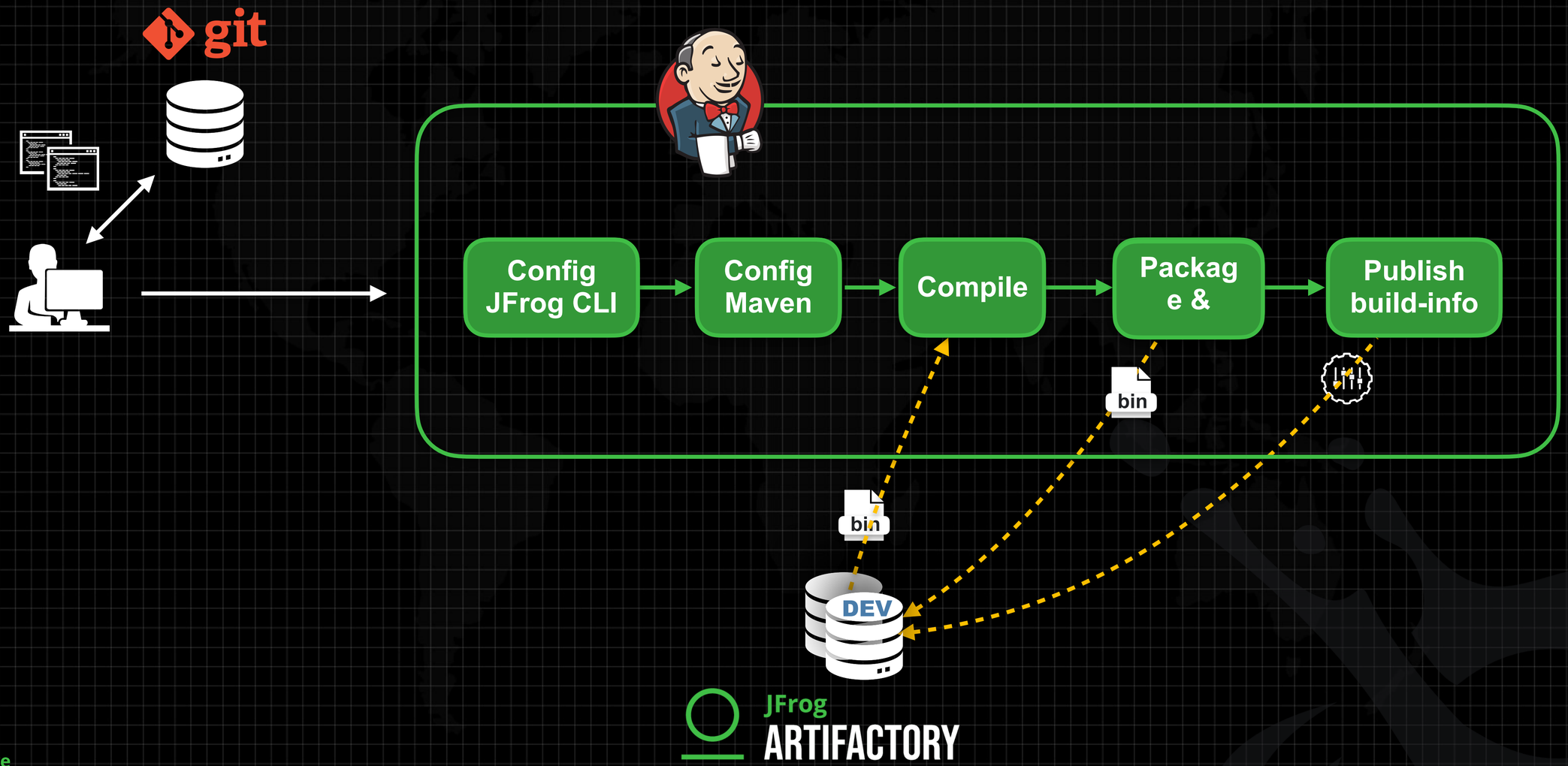
Development Pipeline



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Test Promotion Pipeline

BuildWatch

GS_SPRING_BOOT_main_mvn

BuildPolicy

Critical 9<= CVSS <= 10
Generate violation
Fail Build
High 7 <= CVSS < 9
Generate violation

—fail=false

Approve?

Config JFrog CLI → Scan build → Approve / Discard → Promote build to Test

JFrog XRAY

JFrog ARTIFACTORY

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Staging Promotion Pipeline (I)

BuildWatch

GS_SPRING_BOOT_main_mvn

BuildPolicy

Critical 9<= CVSS <= 10
Generate violation
Fail Build
High 7 <= CVSS < 9
Generate violation

JFrog XRAY

JFrog ARTIFACTORY

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Staging Promotion Pipeline (II)

Approve?

Config JFrog CLI → Scan build → Approve / Discard → Promote build to Staging

BuildWatch

GS_SPRING_BOOT_main_mvn

BuildPolicy

Critical 9<= CVSS <= 10
Generate violation
Fail Build
High 7 <= CVSS < 9
Generate violation

Ignored Violation

Critical

BuildWatch

JFrog XRAY

JFrog ARTIFACTORY

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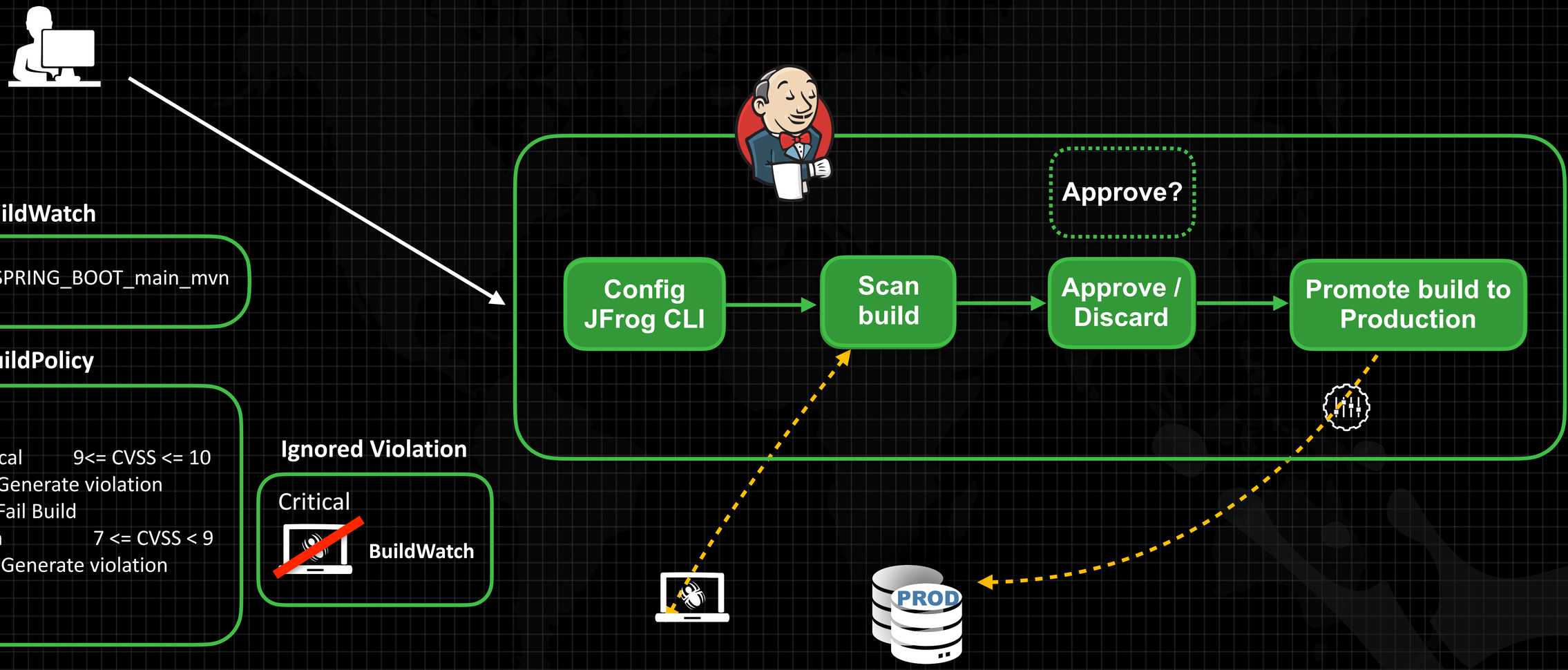
Production Promotion Pipeline



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Deploy on Production Runtime Pipeline (I)

BuildWatch

GS_SPRING_BOOT_main_mvn

BuildPolicy

Critical 9<= CVSS <= 10
Generate violation
Fail Build
High 7 <= CVSS < 9
Generate violation

Ignored Violation

Critical
BuildWatch

Config JFrog CLI

Deploy on runtime

JFrog XRAY

JFrog ARTIFACTORY

RepoWatch

demo-maven-prod-local

RepoPolicy

Critical 9 <= CVSS < 10
Block download

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Deploy on Production Runtime Pipeline (II)

BuildWatch

GS_SPRING_BOOT_main_mvn

BuildPolicy

Critical 9<= CVSS <= 10
Generate violation
Fail Build
High 7 <= CVSS < 9
Generate violation

Config JFrog CLI

Deploy on runtime

Ignored Violation

Critical
BuildWatch

Ignored Violation

Critical
RepoWatch

PROD

bin

JFrog XRAY

JFrog ARTIFACTORY

RepoWatch

demo-maven-prod-local

RepoPolicy

Critical 9 <= CVSS < 10
Block download

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Shift Left

JFrog CLI

JFrog XRAY

Dependencies Scan **Supported: Npm | Maven | Gradle | Pip | Go**

```
[gs-spring-boot/complete] $ jf audit --mvn
```

On-demand Scan *(Stored under Xray / On-demand Scanning)*

```
[gs-spring-boot/complete] $ jf s target/*.jar --watches="BuildWatch"
```

Docker scan *(Existing image in local registry)*

```
$ jf docker scan [repo]/[image]:[tag]
```

BuildWatch

GS_SPRING_BOOT_main_mvn

RepoWatch

demo-maven-prod-local

BuildPolicy

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Generate violation
Fail Build

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RepoPolicy

Critical 9 <= CVSS < 10
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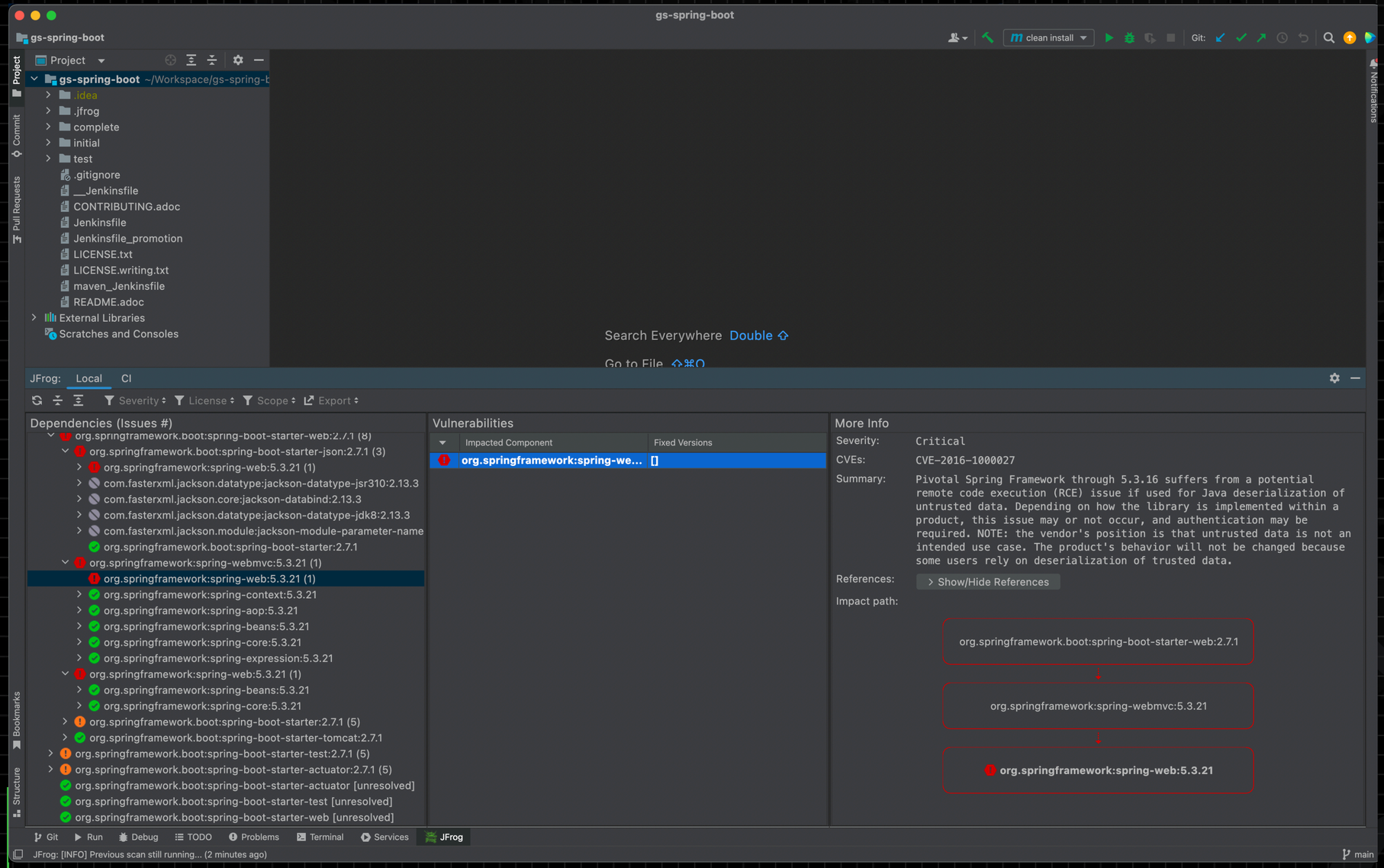
Shift Left (cont.)

IDE Plugin

JFrog XRAY



BuildWatch

GS_SPRING_BOOT_main_mvn

RepoWatch

demo-maven-prod-local

BuildPolicy

Critical 9<= CVSS <= 10
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Fail Build

High 7 <= CVSS < 9
Generate violation

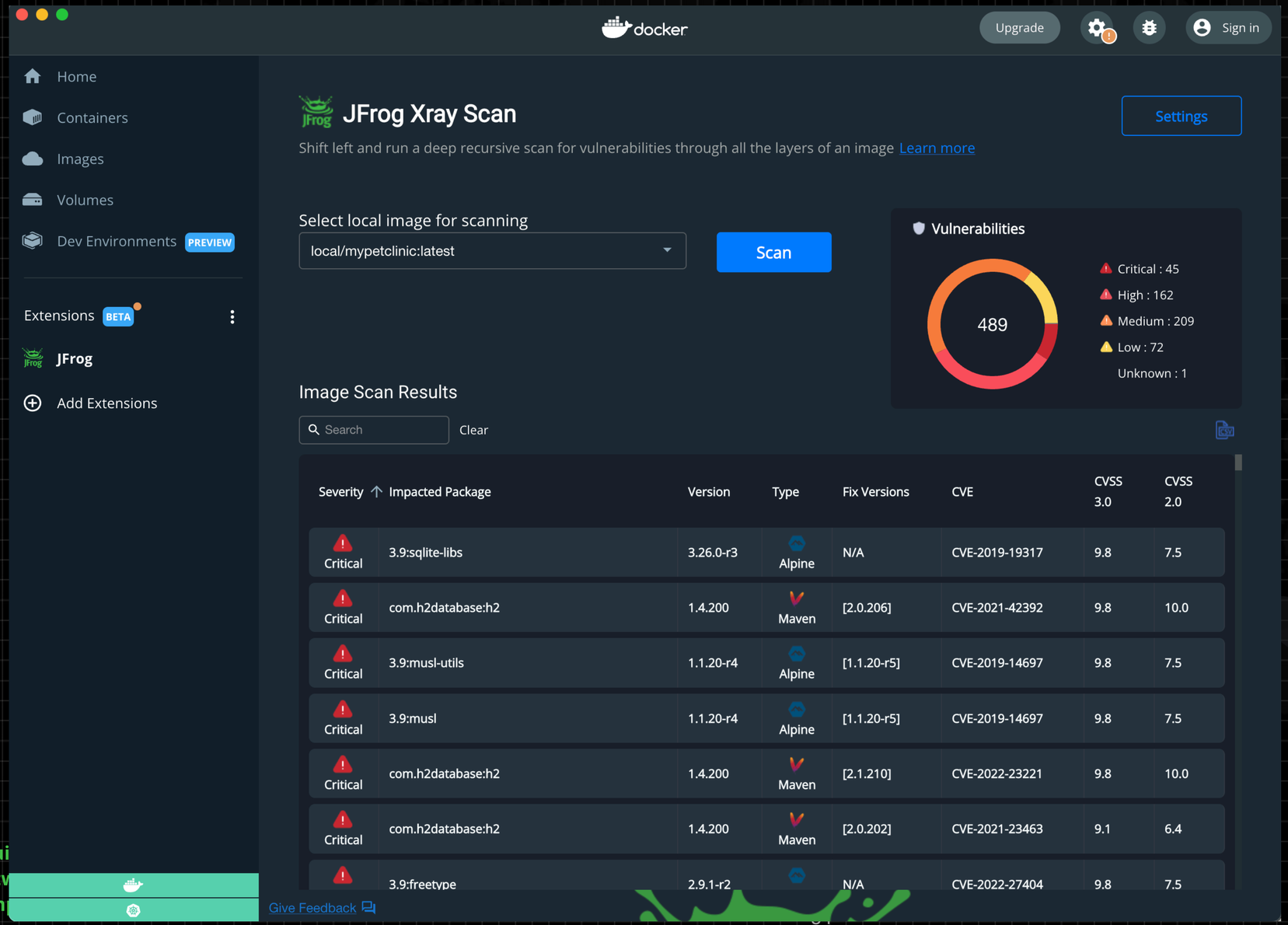
RepoPolicy

Critical 9 <= CVSS < 10
Block download

Shift Left (cont.)

Docker Desktop

JFrog XRAY



BuildWatch

GS_SPRING_BOOT_main_mvn

RepoWatch

demo-maven-prod-local

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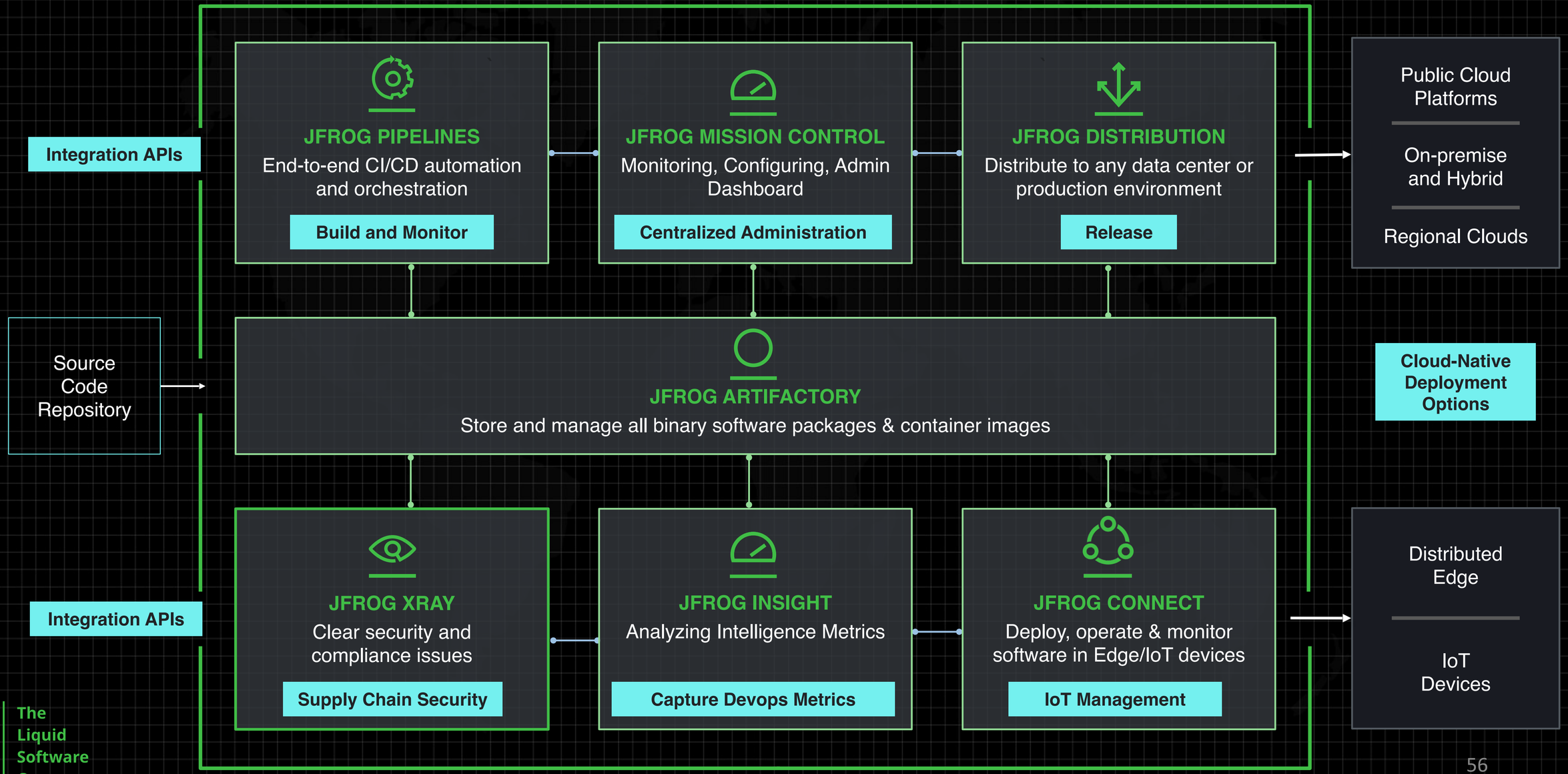
RepoPolicy

Critical 9 <= CVSS < 10
Block download

JFrog Advanced Security

THE JFROG DEVOPS PLATFORM



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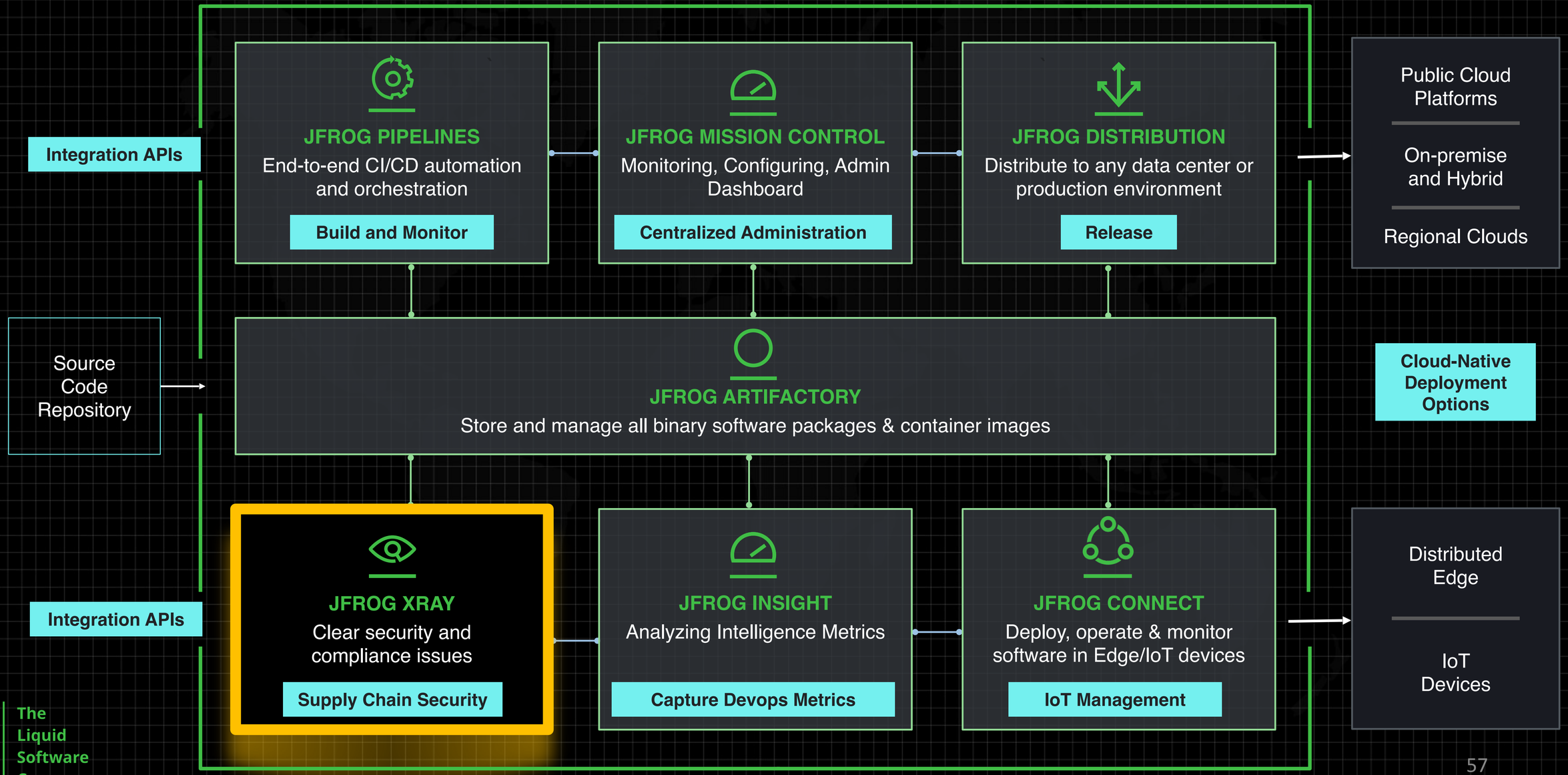
THE JFROG DEVOPS PLATFORM



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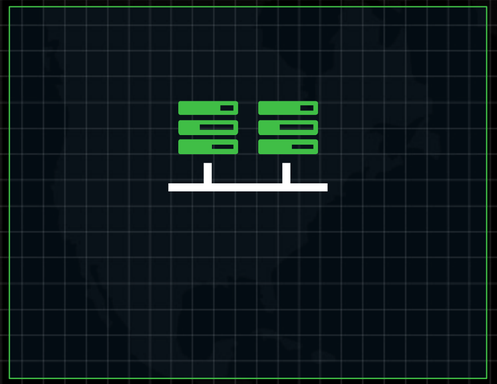
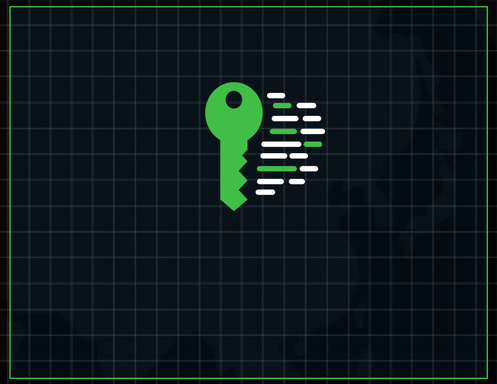
Software Supply Chain Attack Trends

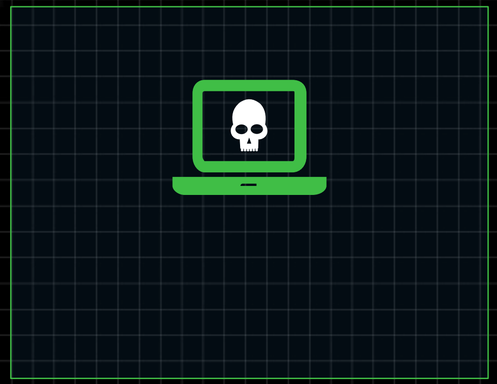


Known vulnerabilities in 3rd Party software (“CVEs”), OSS or Commercial

Unknown vulnerabilities in 1st and 3rd party code (“Zero-days”)



Non-code issues: misconfigurations, IaC, Malpractice, encryption, Secrets: private keys, passwords, services issues



Malicious code pre-injected intentionally via supply chain

JFrog The Liquid Software Company

Software Supply Chain Attack Trends

JFROG XRAY SCA

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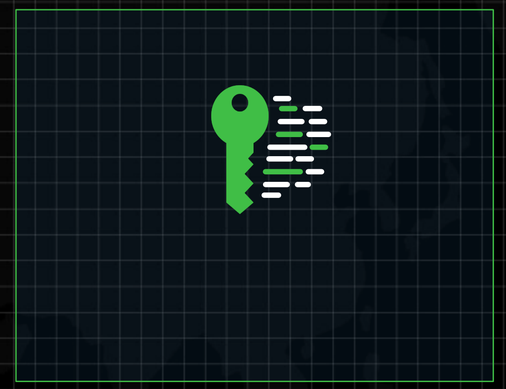

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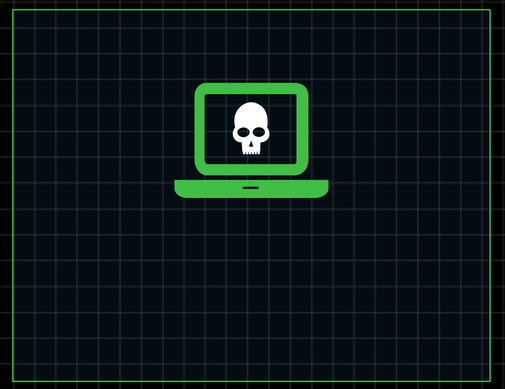

<u>Malicious code</u> pre-injected intentionally via supply chain

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Software Supply Chain Attack Trends

JFROG XRAY SCA

Known vulnerabilities in 3rd Party software (“CVEs”), OSS or Commercial, Contextual Analysis of CVEs

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JFROG ADVANCED SECURITY

Non-code issues: misconfigurations, IaC, Malpractice, encryption, Secrets: private keys, passwords, services issues

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Known vulnerabilities in 3rd Party software (“CVEs”), OSS or Commercial, Contextual Analysis of CVEs

ROADMAP

Unknown vulnerabilities in 1st and 3rd party code (“Zero-days”)

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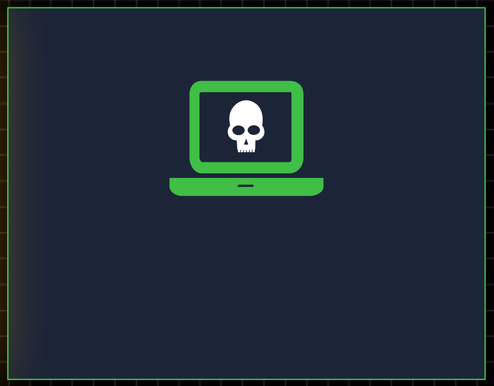
Non-code issues: misconfigurations, IaC, Malpractice, encryption, Secrets: private keys, passwords, services issues

ROADMAP



Malicious code pre-injected intentionally via supply chain

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Reinforcing Xray's Supply Chain Security Capabilities

SBOM

MALICIOUS PACKAGES

New !

SCA +

VULNERABILITIES

LICENSES

OPERATIONAL RISK

ADVANCED SUPPLY CHAIN-WIDE SECURITY CAPABILITIES

- SERVICES EXPOSURE
- SECRETS DETECTION
- IAC SECURITY ANALYSIS
- CONTEXTUAL ANALYSIS
- APPLICATION EXPOSURE

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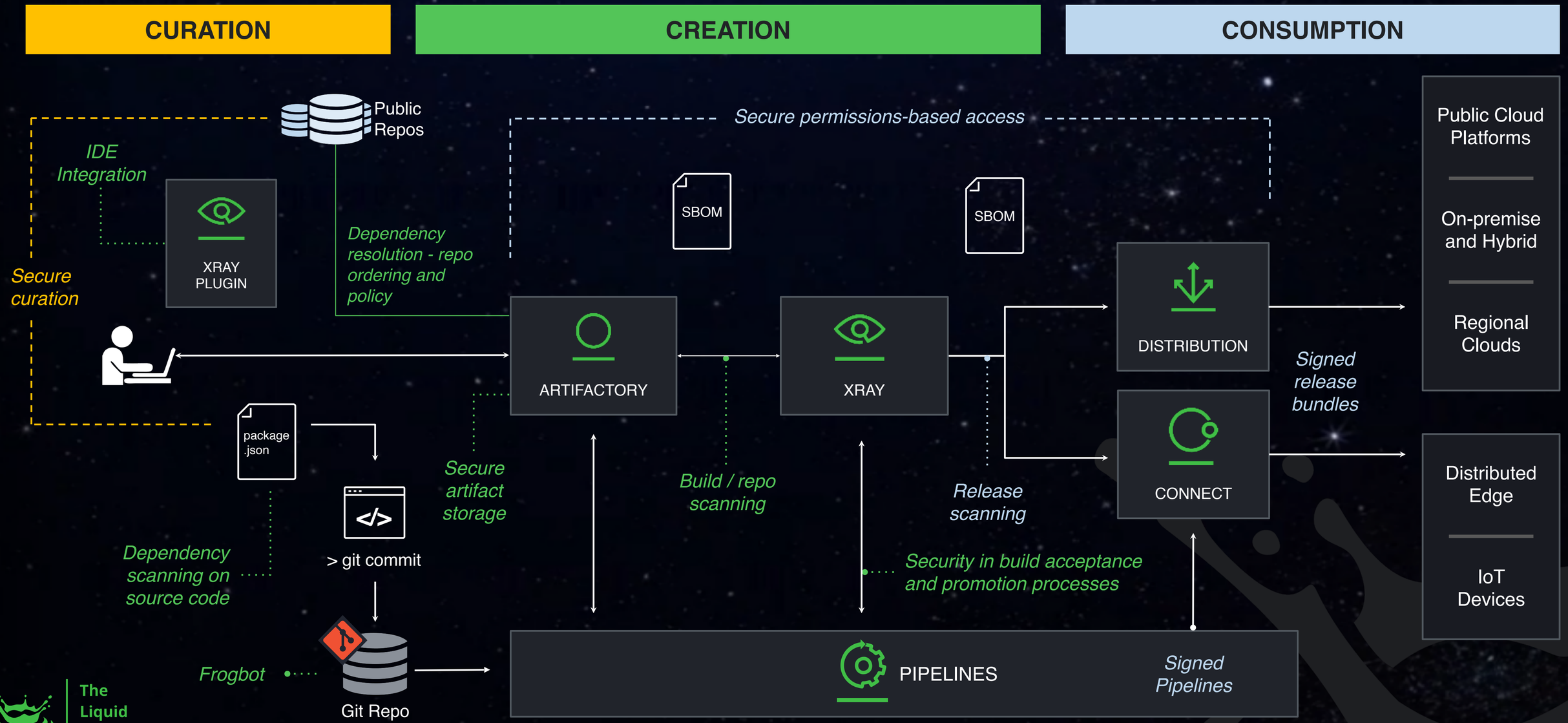
Security & Compliance: Infused Throughout The SSC



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JFrog Advanced Security Capabilities

CONTEXTUAL ANALYSIS

Scan containers to identify and prioritise whether OSS vulnerabilities are actually exploitable.

SECRETS DETECTION

Detects any secrets left exposed in any containers stored in Artifactory to stop any accidental leak of internal tokens or credentials.

APPLICATION EXPOSURE

Find configuration issues, security malpractices, and insecure usage of popular OSS libraries related to your application framework

SERVICES EXPOSURE

Detect configuration issues and security malpractices for specific services and daemons included in your artifacts

IAC SECURITY ANALYSIS

Infrastructure-as-Code (IaC) Security Analysis
Scans IaC files stored in Artifactory for early detection of cloud and infrastructure misconfigurations to prevent attacks and data leak.

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Contextual Analysis Coverage

JFrog Research Extended CVE Information

1100+ CVEs

JAS Contextual Analysis Scanner

400+ CVEs

40

Contextual Scanners Monthly

JFrog

IMAGINE

Distribute your software with JFrog Distribution

The
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Who is consuming the distributed software

Customer's deployment infr. / devices

External ecosystem / customers / partners

Customer's own Developers

RUNTIME DISTRIBUTION

EXTERNAL DISTRIBUTION

INTERNAL DISTRIBUTION

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Possible Solutions

- Cloud Storage Hosted Solution
- CDN
- Download Centers
- Replication
- Federated Repositories
- JFrog Distribution

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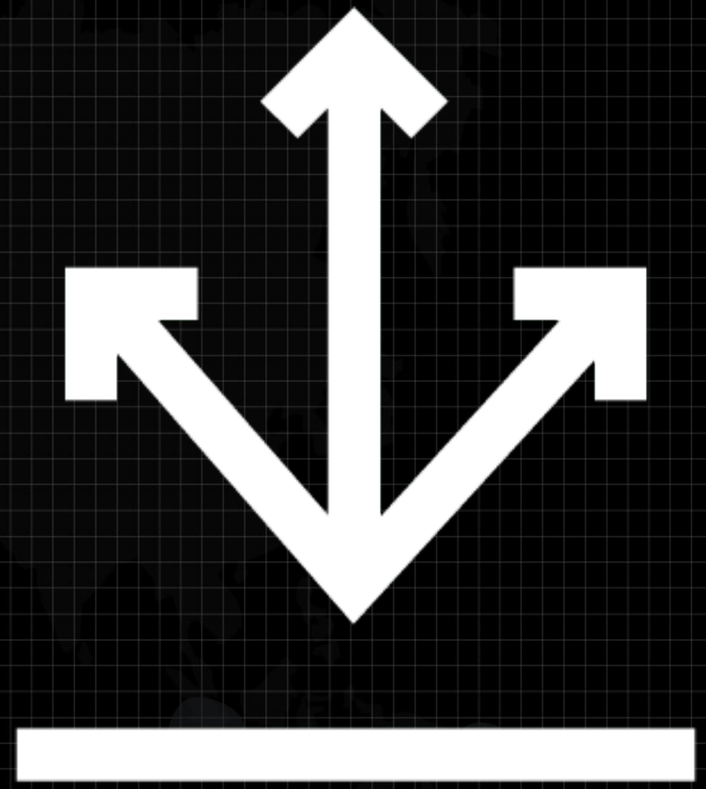

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Overview of the JFrog Platform

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Overview of the JFrog Platform

BUILD & TEST → RELEASE → DEPLOY

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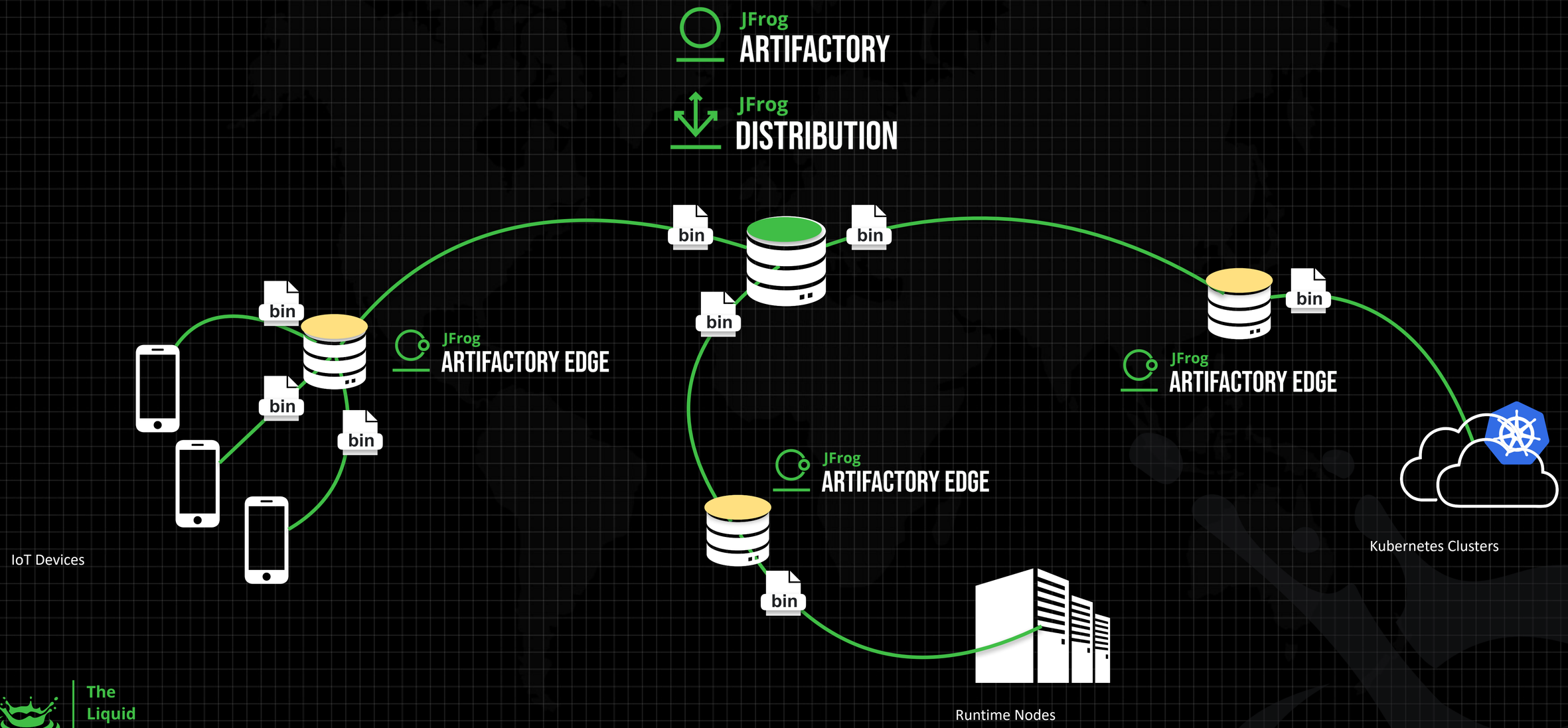
Runtime & Infrastructure EDGE Distribution



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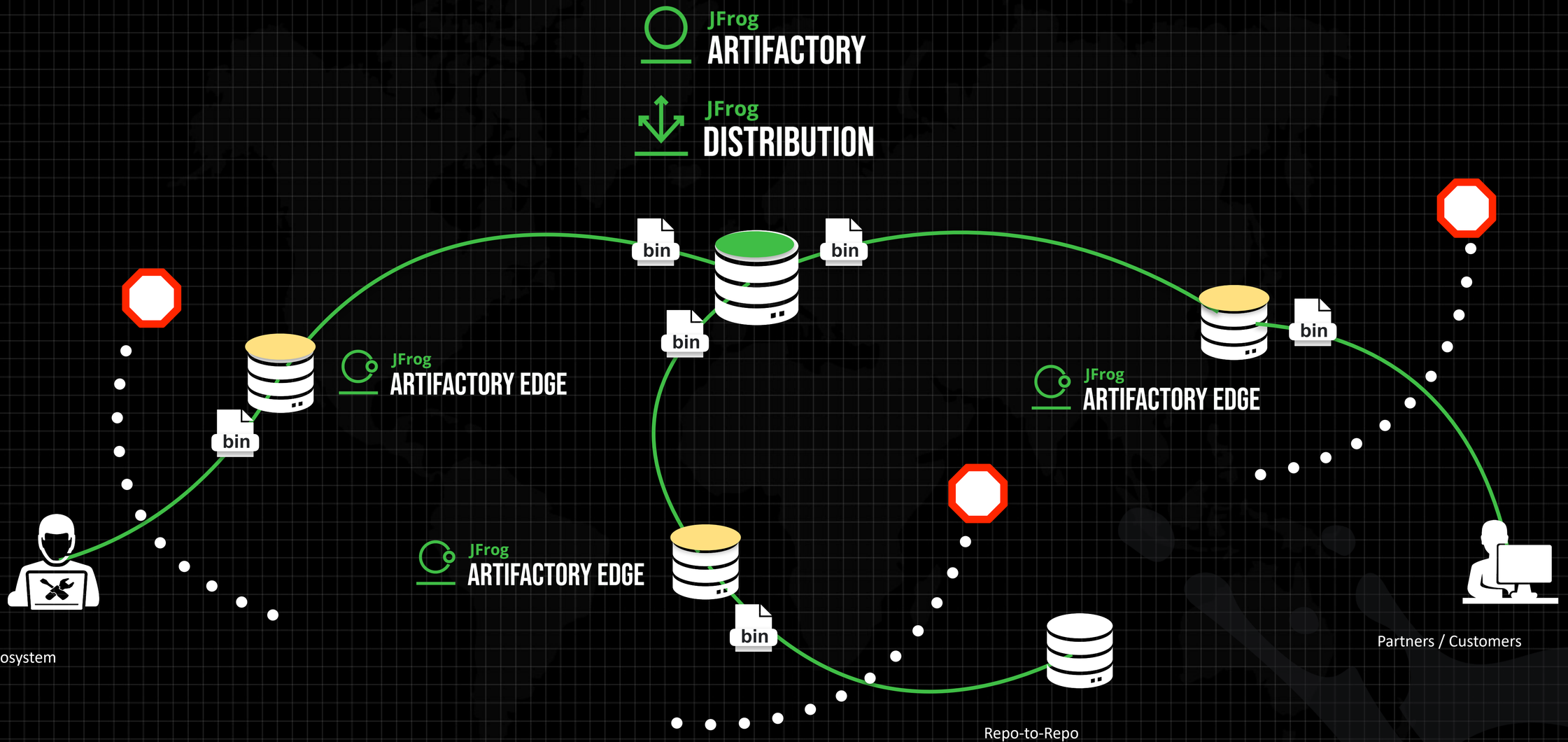
External Distribution



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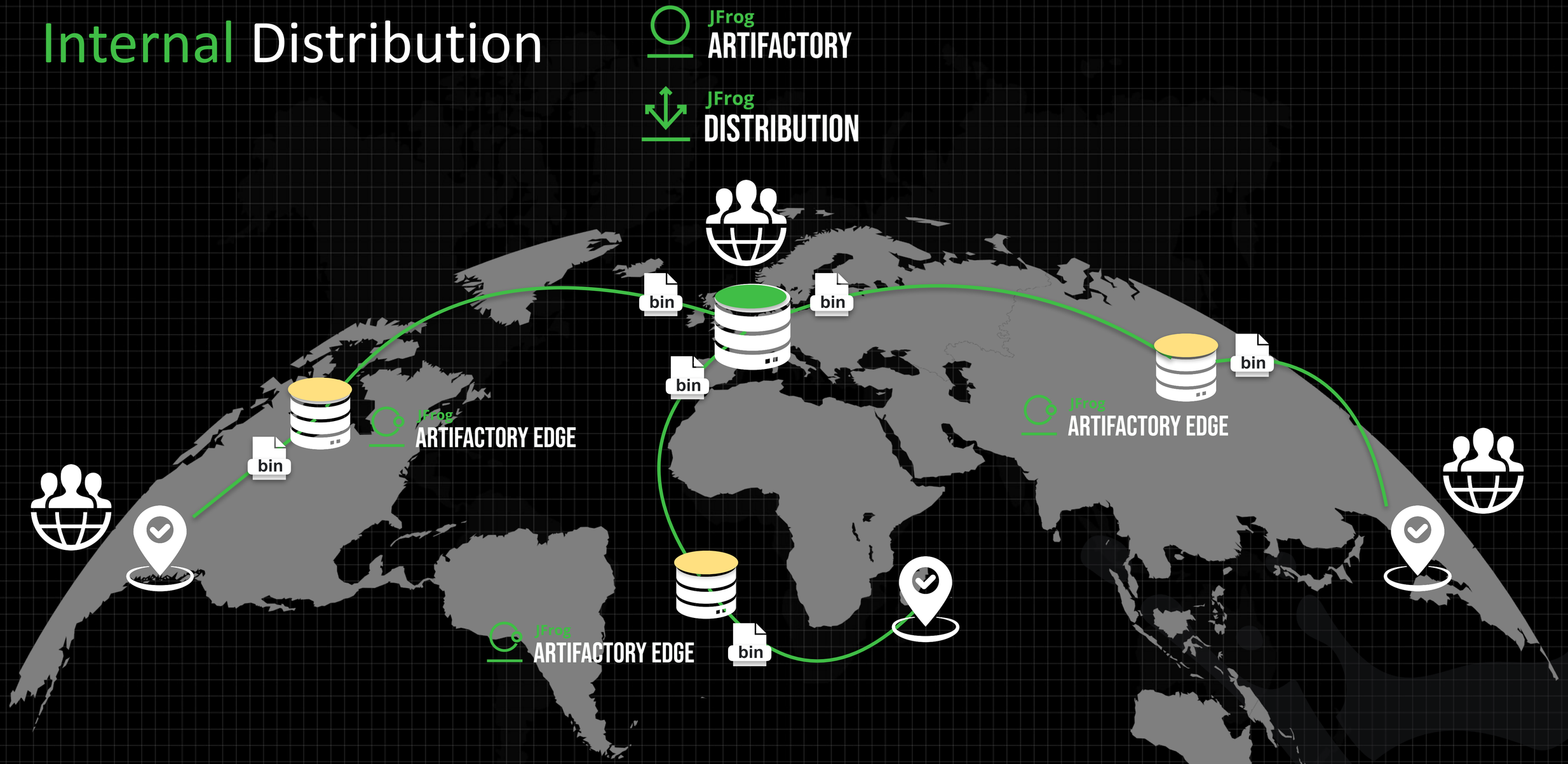
Internal Distribution



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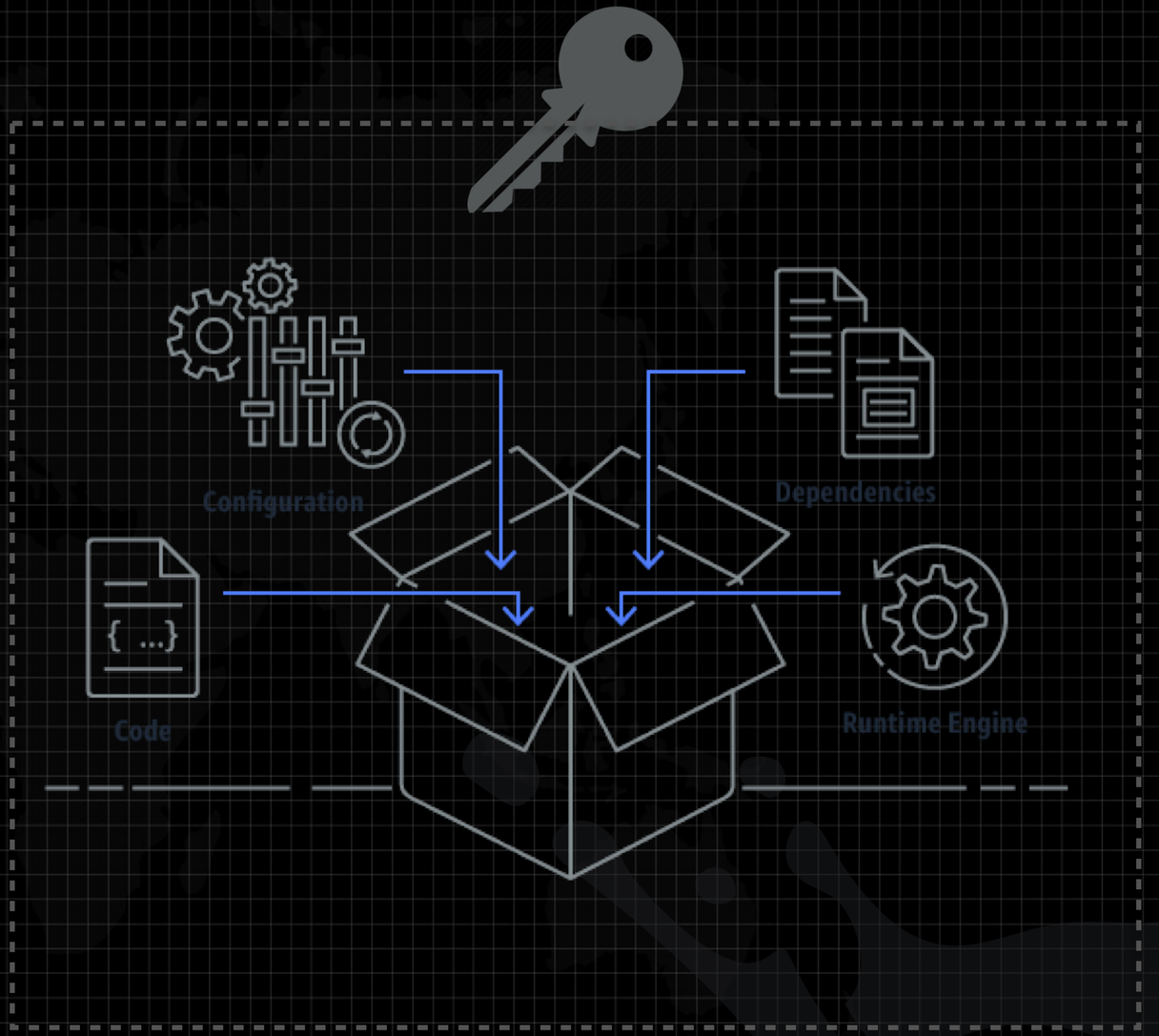
Release Bundle

- A Release Bundle is a collection of artifacts grouped together
- This can be for example a Docker image together with a Helm chart
- Release Bundles can be created using REST API, CLI or through the Distribution UI
- Creating a Release Bundle requires Release Bundle writing permissions
- Secured and immutable



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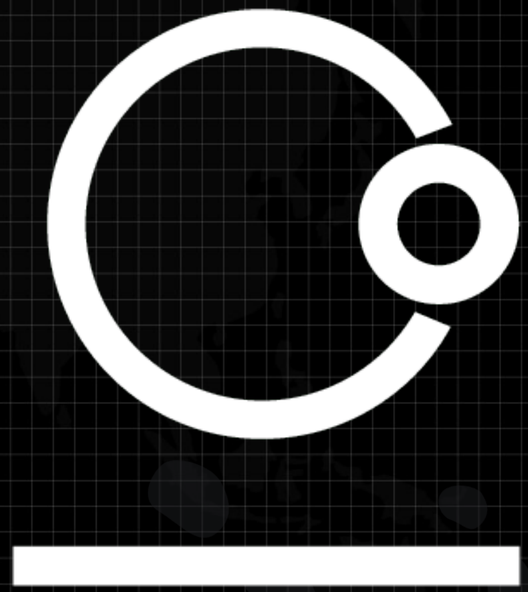
Edge Node

- “Read-only” artifactory
- Deployed physically close to the final destination of the artifact
- Direct upload of artifacts to an Edge node is not possible (except for a designated generic repository)
- No Remote repos (only smart remote repositories)
- No Build Integration
- No Xray scans allowed



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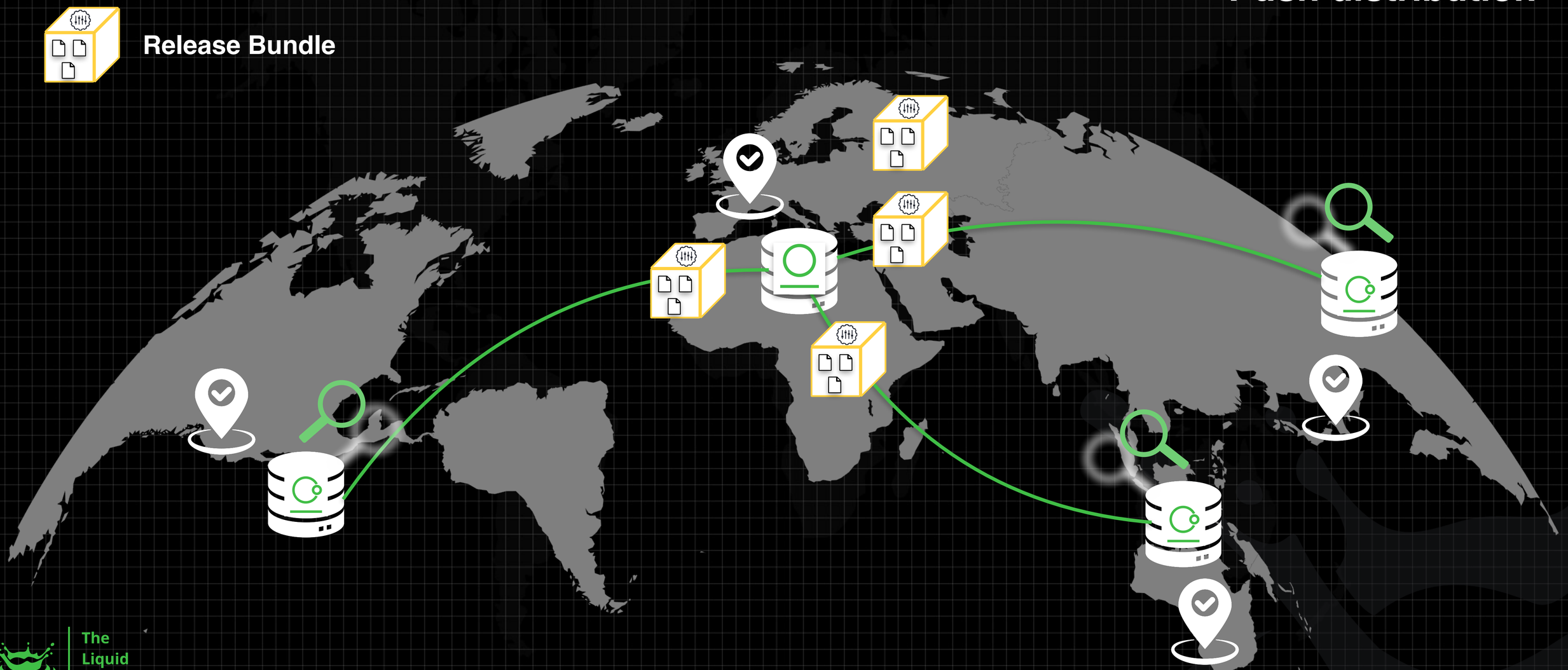
Distributing software across the globe

Push distribution



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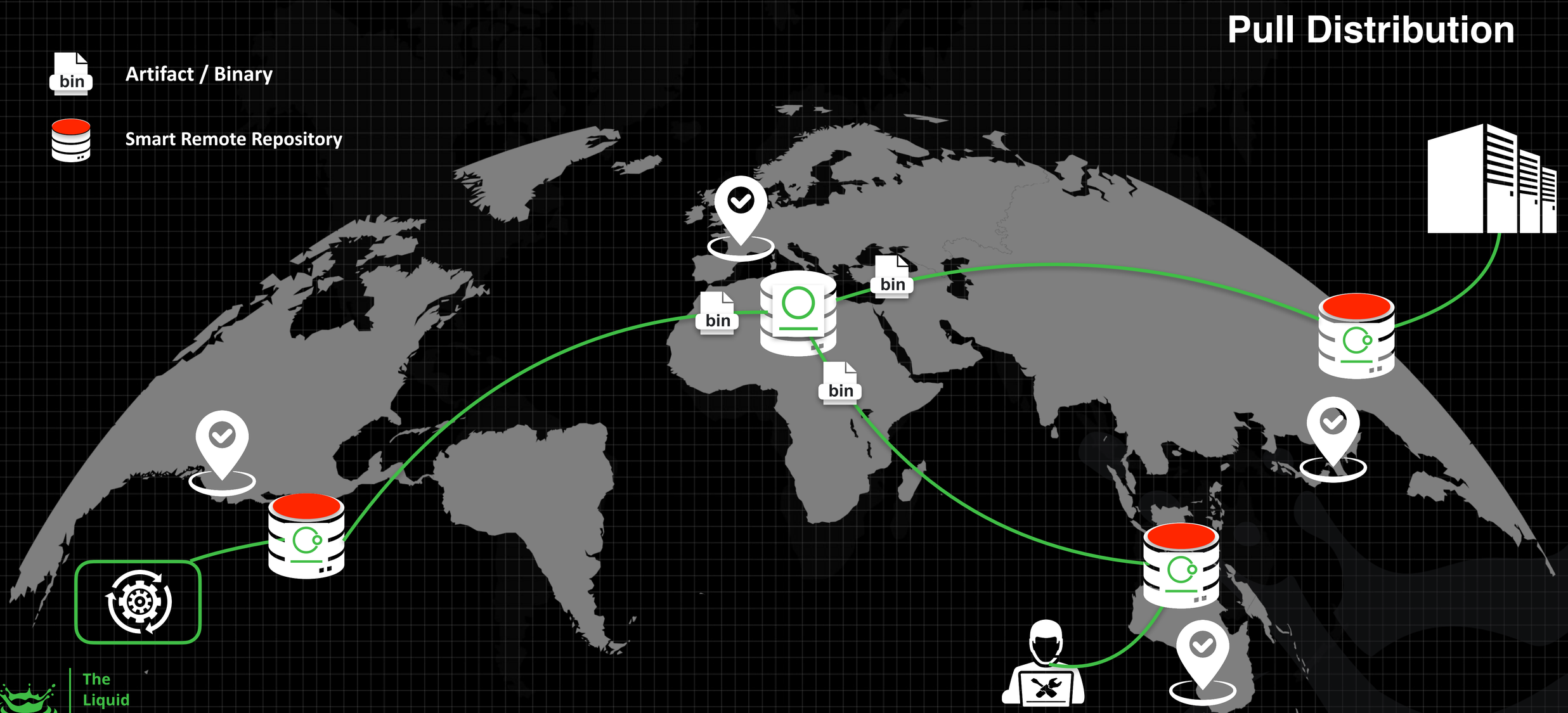
Distributing software across the globe



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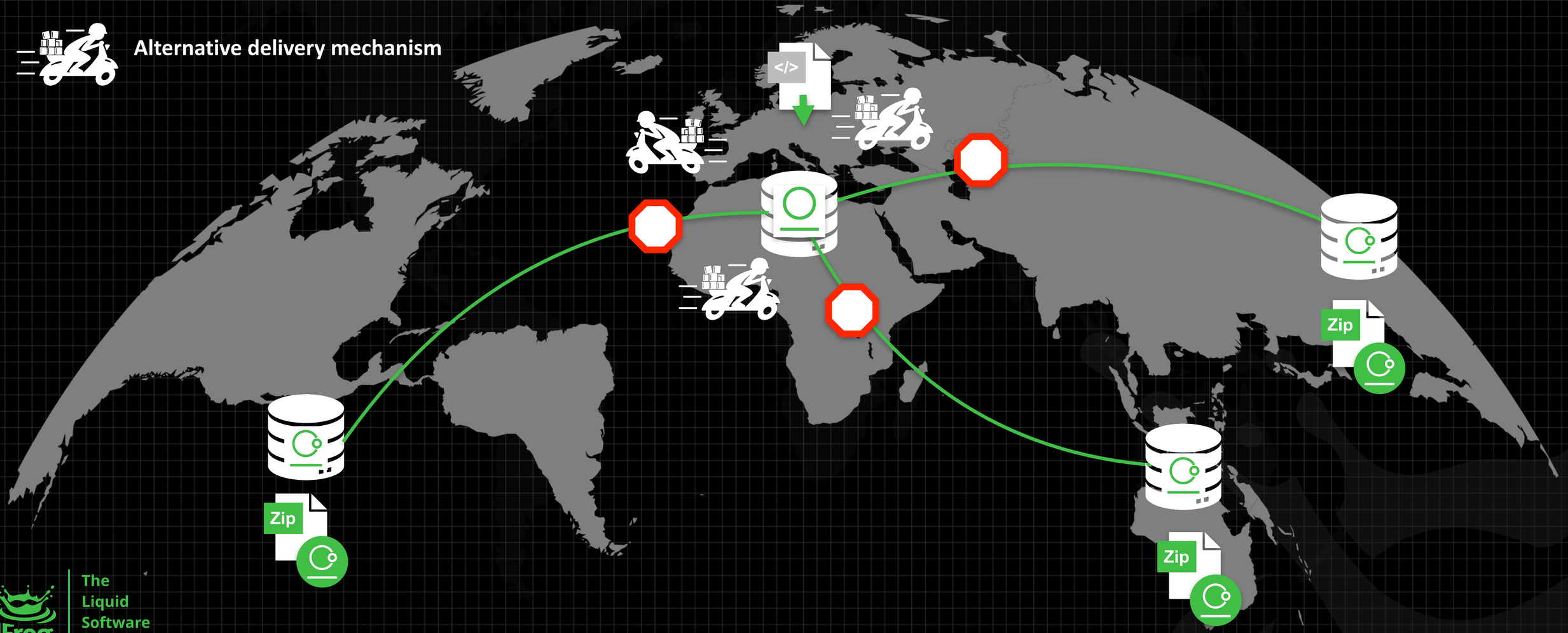
Distributing software across the globe

Air Gap Distribution

Firewall rules

Alternative delivery mechanism



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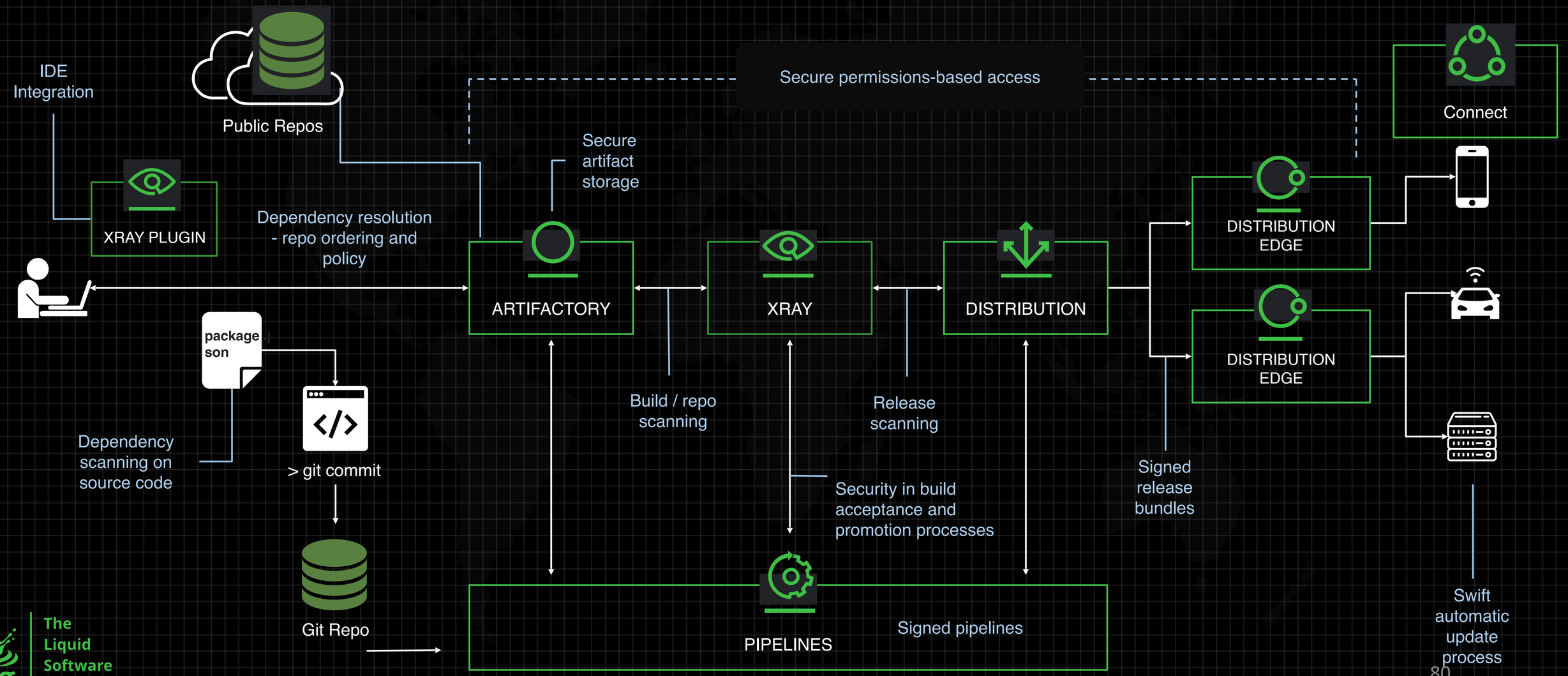
End-to-end security with the JFrog Platform

Continuously securing the software supply chain



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