RED HAT SUMMIT

HOW TO DEPLOY 1000 APPS INTO A SINGLE RED HAT JBOSS EAP DOMAIN

Allianz AMOS - Customer Success

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AMOS IBEROLATAM

Allianz Managed Operations & Services

- Its mission is to transform Allianz into a digital group

- Provides the worldwide family of Allianz companies with in-house services in the fields of IT Infrastructure, Application Platforms and Business Services

  - Infrastructure: Consolidating data centers improves services and keeps IT resilient to disasters.

  - Application Platforms: Integrated core insurance applications help streamline the product portfolio and support interdisciplinary product sales through multiple channels.

  - Business Services: Optimized transactional processes and expert services

- Focused in Iberia (Spain, Portugal) and LATAM (Brazil, Colombia) regions

- Support for different Allianz's brands in these regions

- More info here.

MIGRATION PROJECT

MIGRATION PROJECT

Everything starts here

Source Platform

- Bare Metal + Windows OS
- IBM WebSphere Application Server 8
- IDE Development Life Cycle
- Custom Ant/Java Development life cycle: Building, Deployment
- CI/CD not homogenous: Jenkins, Rational Build Forge, RTC
- Applications Governance based in RTC metadata
- SSO: LTAP Token
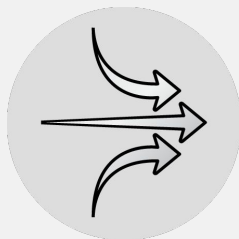
Target Platform

- Virtual Machines + RHEL
- Red Hat JBoss EAP 6.4
- Maven Development Life Cycle
- Integrated Ant/Java in Maven lifecycle
- CI/CD homogenous: Jenkins, RTC
- Applications Governance in pom.xml files
- SSO: PicketLink SAML

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MIGRATION PATH

Automation, Standardization and Reuse

- Red Hat Center of Excellence
- Migration Teams
- Knowledge base
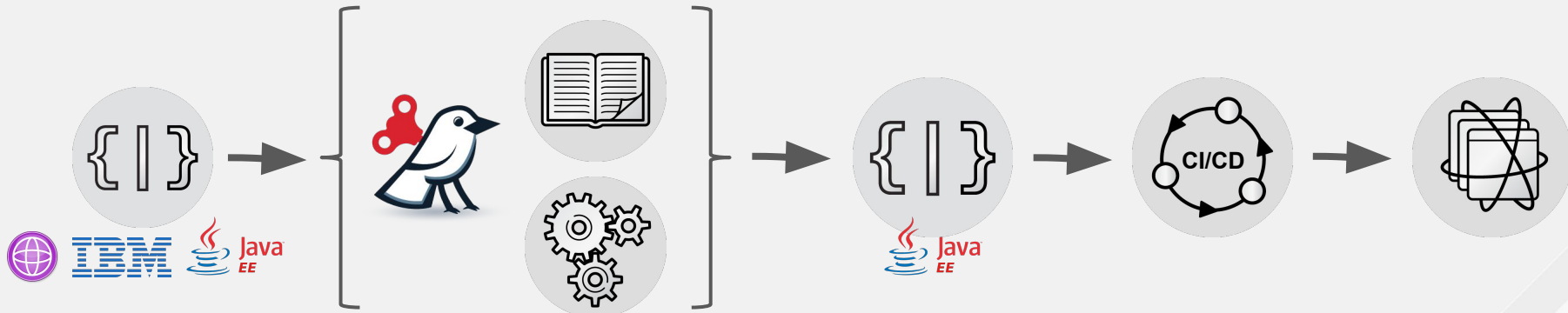
DOMAIN MODEL

APPLICATIONS MAP

Components deployed into Red Hat JBoss EAP

- **Static Modules:** Static global libraries used for any other component
  - Main core functions: Logging, Security, Mainframe/DB2 access, …
  - JAR files shared by underlying file systems

- **Dynamic Modules:** Dynamic global libraries used by set of applications
  - No core functions: CommAreas, API Business Logic, …
  - Automatically restart dependent applications
  - Deployed as EAR files without any context in each server

- **Business Applications:** Applications used by final users (internal/external)
  - Web: JSP/Servlets, Apache Struts, Spring Web Flow
  - Web Services: Axis, IBM SOAP RPC
  - Liferay Portal: Portlets, Hooks, Themes, Layouts
  - Deployed as WAR files
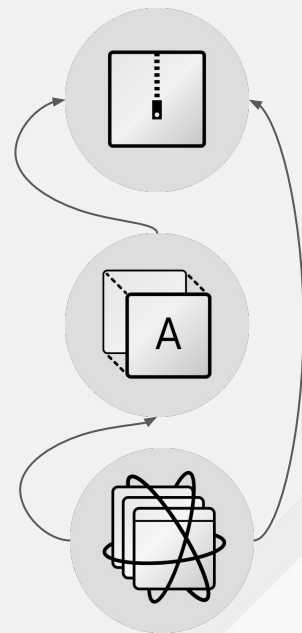
WHY A DOMAIN MODEL?
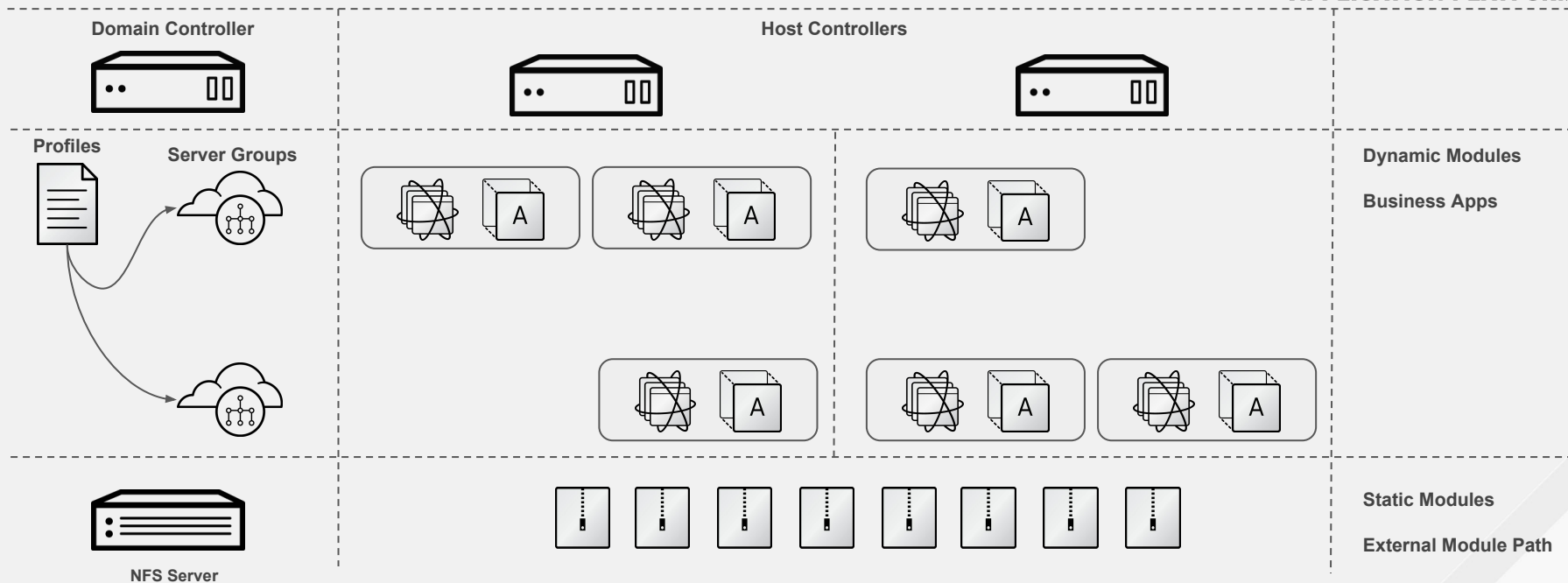
Domain Model vs Standalone Model

- Multi-server centralized management solution

- Server's configuration consistent with Profiles and Server Groups

- Roll out configuration changes or deployments in a coordinated fashion

- Isolated Domains to serve a specific region, country, company structure or IT process

- Defined server-groups for each group of applications

- Design similar to previous one well know by Application Server Team

- Standalone mode used for developer based workstation

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DOMAIN DESIGN

Applications and Domain Components

Domain Controller

Host Controllers

Profiles

Server Groups

Dynamic Modules

Business Apps

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A

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Static Modules

External Module Path
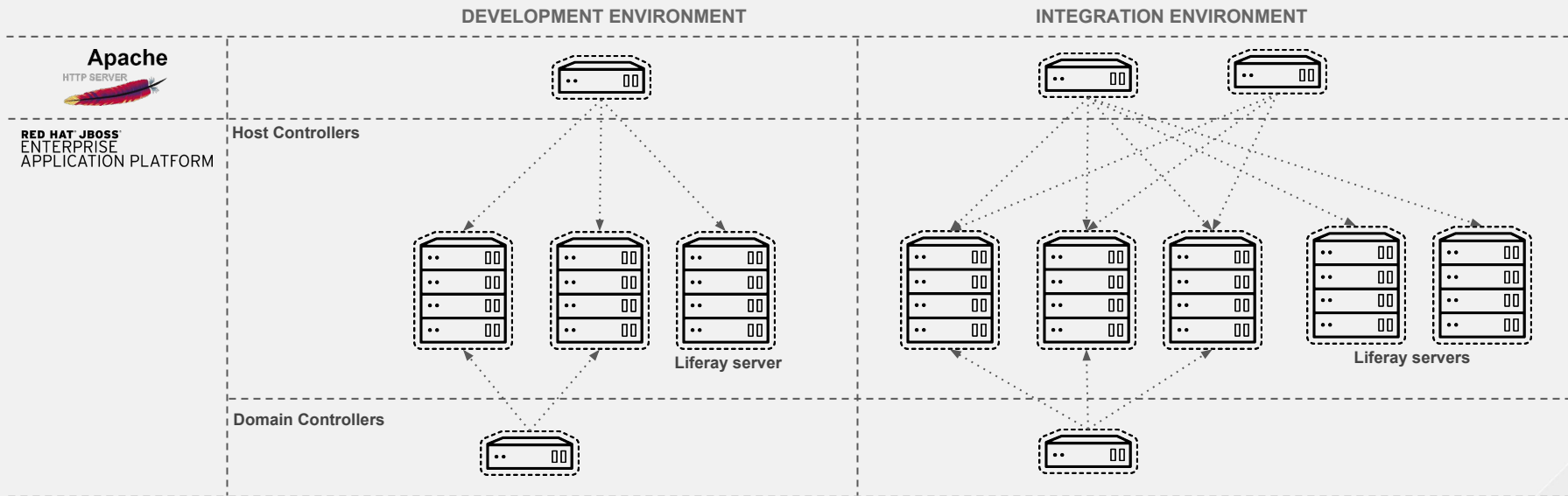
NFS Server

DOMAIN ENVIRONMENTS

EAP ENVIRONMENTS

Different Environments, Different Uses

- Non-Production Environments:

  - Development: Development Testing and Development Integration

  - Integration: Business Testing, QA, Performance, Versioning to production

  - Full Digital: Demo environment

- Production Environments:

  - Pre Production: Promotion testing, Staging version

  - Production

EAP ENVIRONMENTS

Non-Production Environments

Apache
HTTP SERVER

RED HAT JBOSS
ENTERPRISE
APPLICATION PLATFORM

Host Controllers

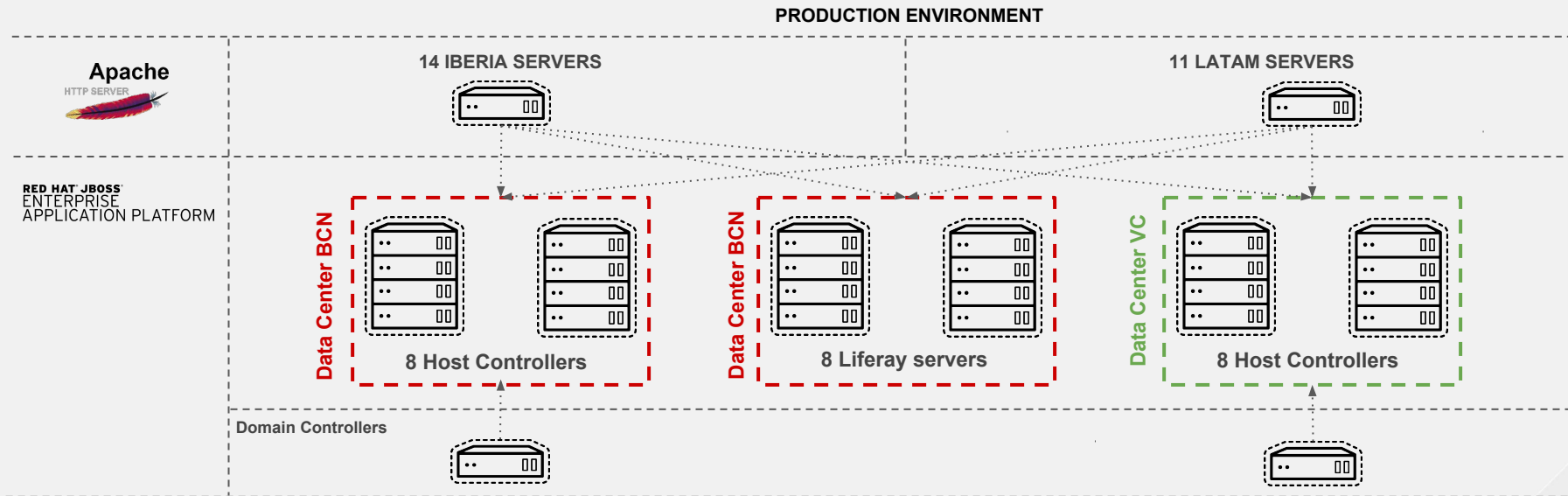Liferay server

Liferay servers

Domain Controllers

- **795** Web Applications
- 76 Dynamic Applications
- 89 Liferay Applications
- ~ 20 Server Groups per HC

- **713** Web Applications
- 76 Dynamic Applications
- 83 Liferay Applications
- ~ 30 Server Groups per HC

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EAP ENVIRONMENTS

Production Environments

DEPLOYMENT MODEL

CI/CD PIPELINE

Build and Roll-out apps automatically

RED HAT JBOSS
DEVELOPER STUDIO

Rational Team Concert

Jenkins
maven

Nexus

CI | CD

Jenkins

.SH

NON-PRODUCTION ENVIRONMENTS

PRODUCTION ENVIRONMENTS

CI | CD

.SH

Control-M

Apache
HTTP SERVER

Domain Controller

RED HAT JBOSS
ENTERPRISE
APPLICATION PLATFORM

Apache
HTTP SERVER

RED HAT JBOSS
ENTERPRISE
APPLICATION PLATFORM

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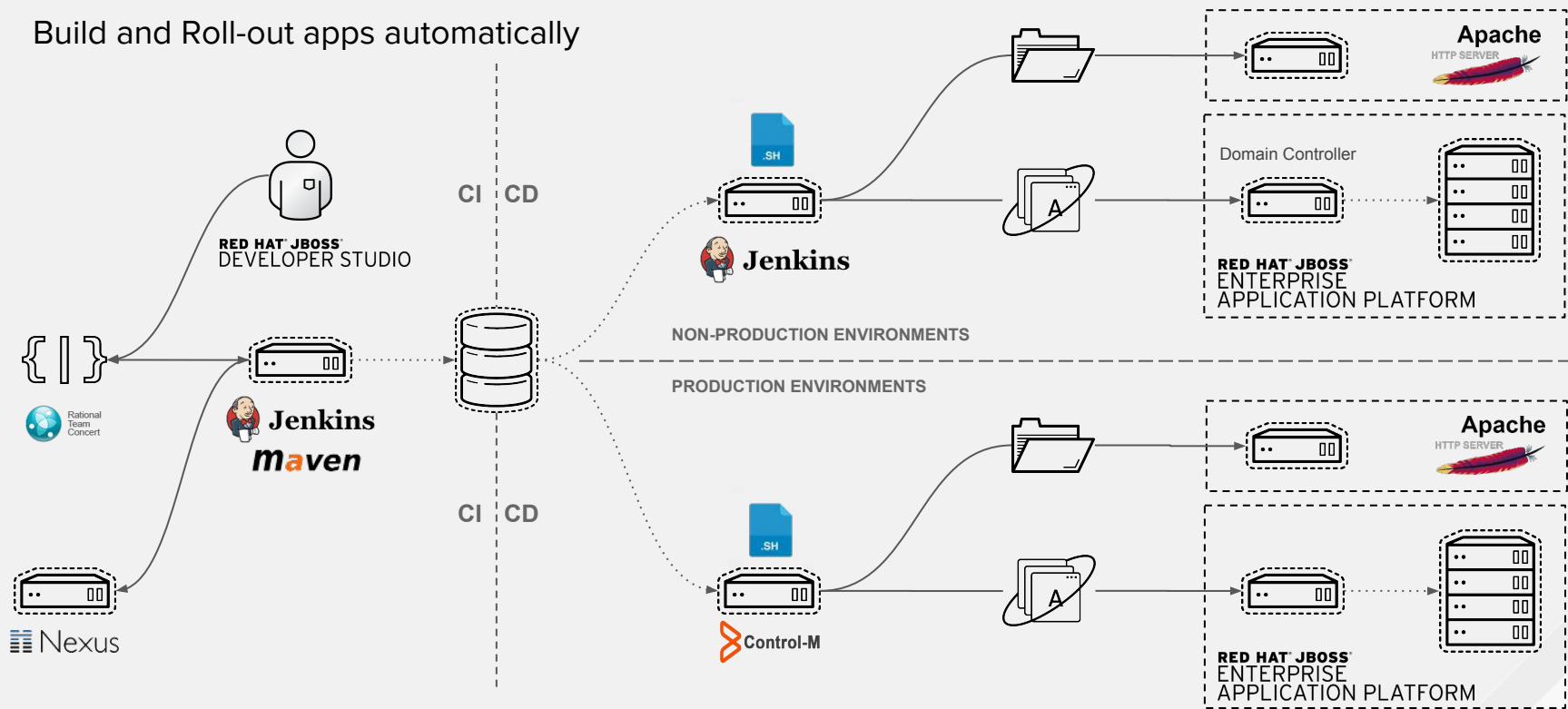
CI/CD PIPELINE

Build and Roll-out apps automatically
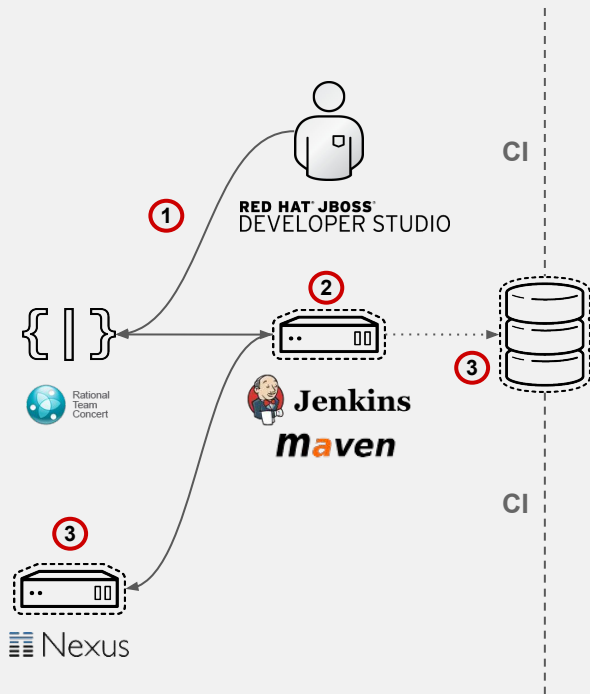
Cycle based on Maven and Orchestrated by Jenkins

1. Code changes are committed in source control repository.

2. In **DEV** environment each build Jenkins job, It's executed manually by developers, checking out, building and testing code, base on parameters like environment or kind of artifact.

3. Generated artifacts are uploaded to maven repos and save in a centralized storage from where the CD steps will take it.

● In the rest of environments (**INT, FDT, PRE, PRO**), Jenkins jobs are executed when code is promoted between environments.

CI/CD PIPELINE

Build and Roll-out apps automatically

NON-PRODUCTION ENVIRONMENTS
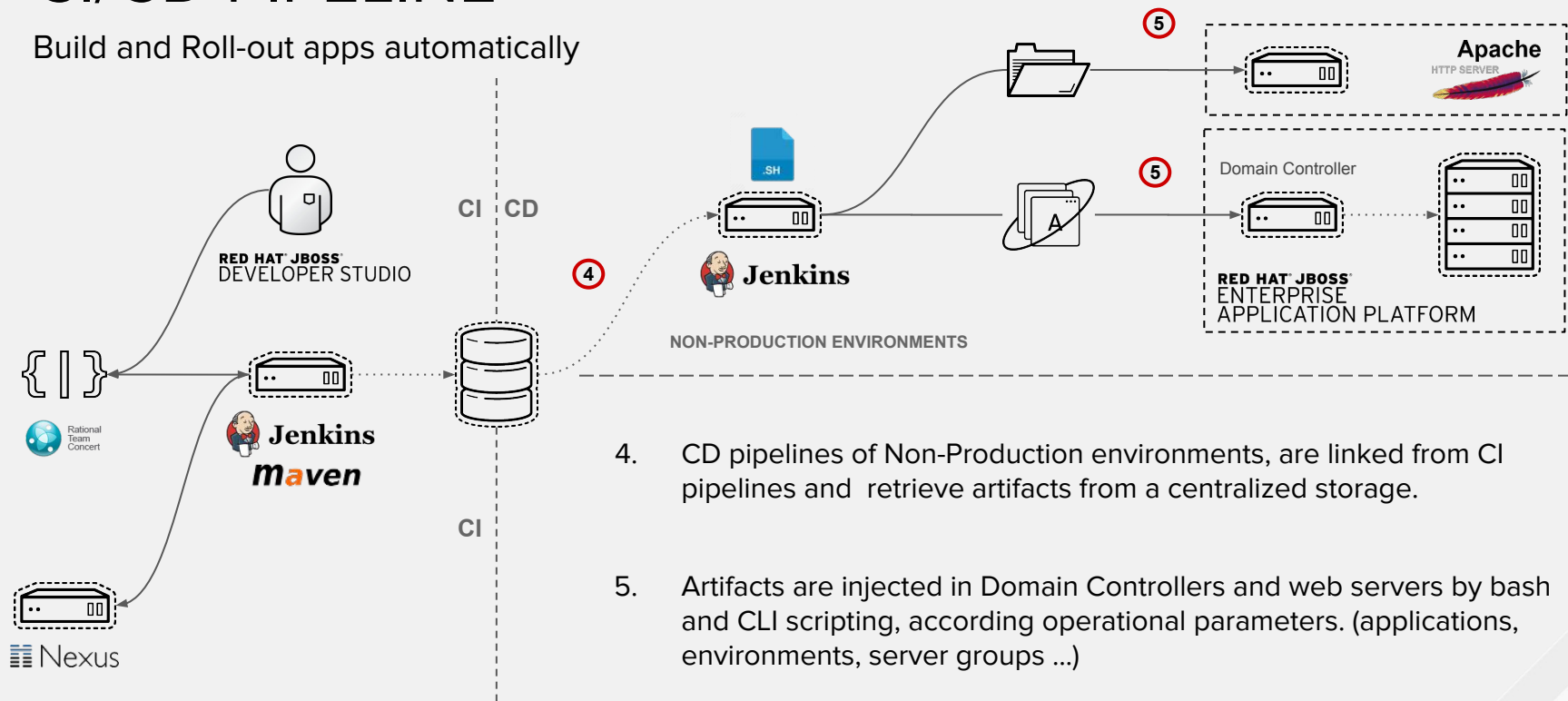
4.   CD pipelines of Non-Production environments, are linked from CI pipelines and retrieve artifacts from a centralized storage.

5.   Artifacts are injected in Domain Controllers and web servers by bash and CLI scripting, according operational parameters. (applications, environments, server groups ...)
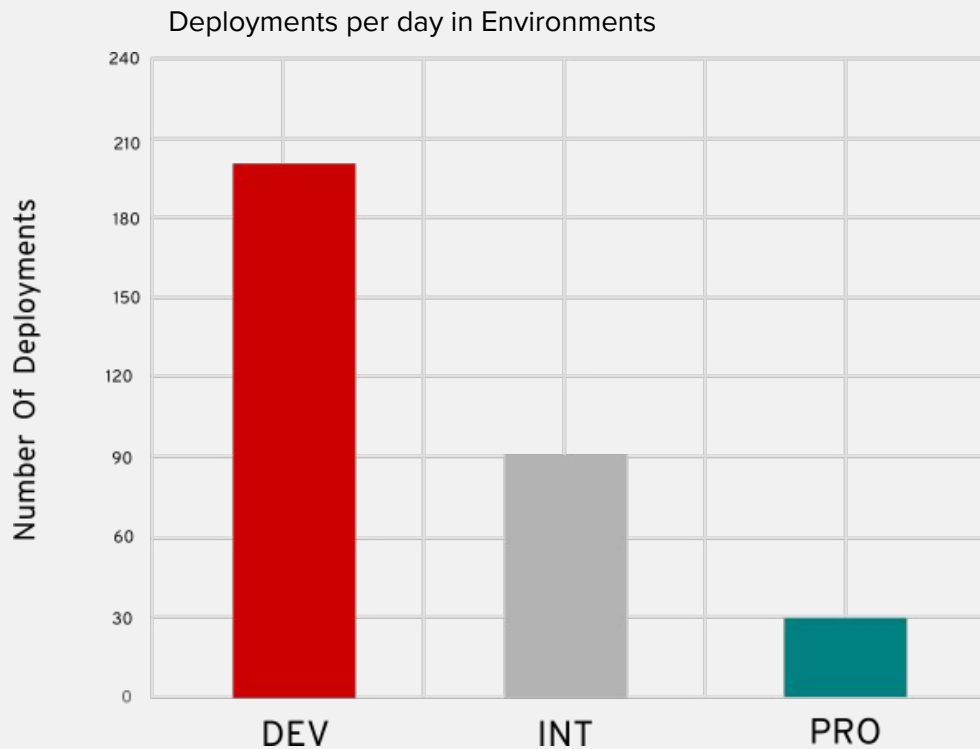
CI/CD PIPELINE

Build and Roll-out apps automatically
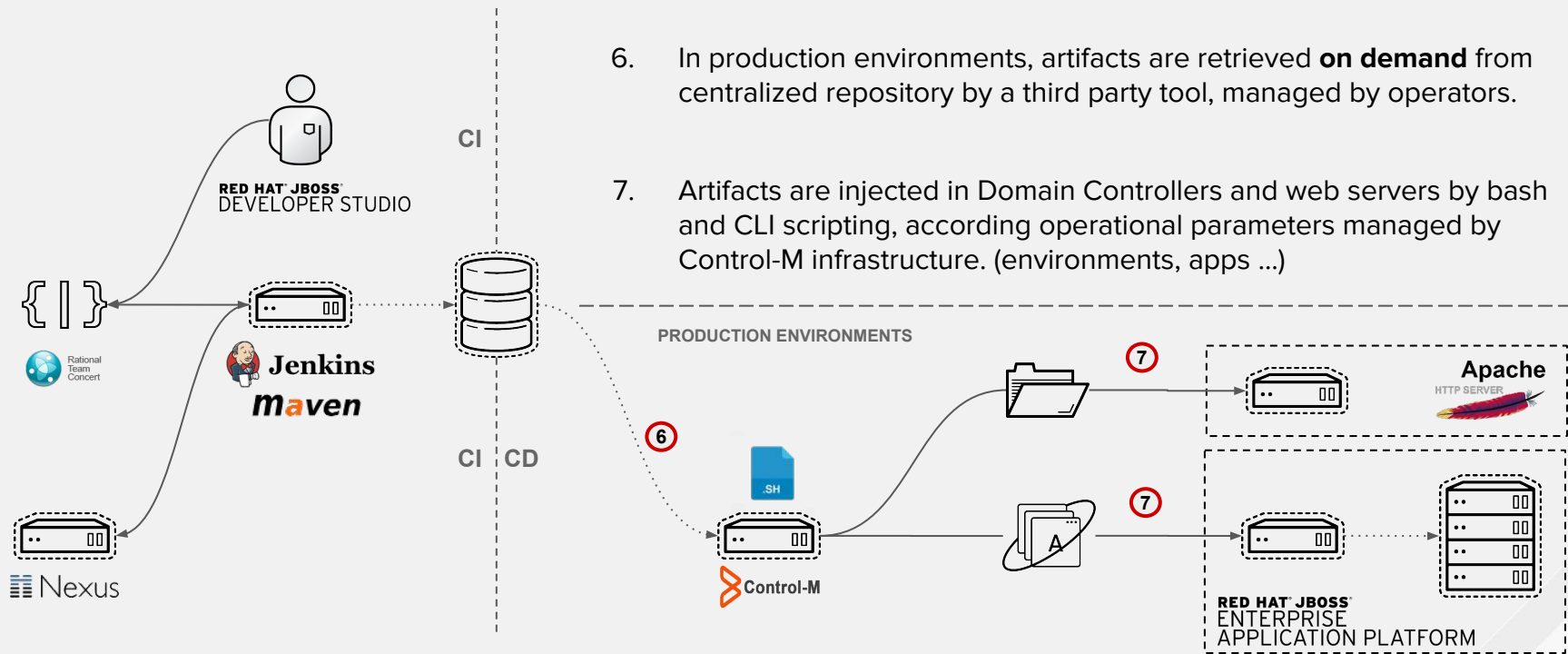
6. In production environments, artifacts are retrieved **on demand** from centralized repository by a third party tool, managed by operators.

7. Artifacts are injected in Domain Controllers and web servers by bash and CLI scripting, according operational parameters managed by Control-M infrastructure. (environments, apps ...)

CI

CI CD

RED HAT JBOSS
DEVELOPER STUDIO

Rational Team Concert

Jenkins

maven

Nexus

PRODUCTION ENVIRONMENTS

⑥

.SH

⑦

⑦

Control-M

Apache
HTTP SERVER

A

RED HAT JBOSS
ENTERPRISE
APPLICATION PLATFORM

CI/CD IN NUMBERS

Deployments per day in Environments

- In Non-Production environments there is a one to one relation between builds and deployments

- Artifacts in Production environment are deployed once a week **on demand**

- In Production environments there is a many to one relation between builds and deployments

CONCLUSIONS

WHAT WAS NOT GOOD

Not everything always works successfully

- Apache Web Server performance issues:
    - Root Cause: Many back-ends (WAS, EAP, Liferay) with a huge number of contexts
    - Resolution: Tuning and Performance tasks in RHEL, Apache Web Servers and mod_cluster

- Domain hang up issue with some deployments:
    - Root Cause:
        - Dynamic Modules with several Business Application dependencies. Race condition with three levels of dependencies
        - Deployment fails and rollback hangs Management Process
    - Resolution:
        - Refactor some application dependency relationships
        - Ad hoc scripts to mitigate
        - Hot-fix and final patch EAP 6.4.14

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TEAM WORK

Connection, Trust, Transparency, Collaboration

- It would be impossible to achieve this project without Great Team Work

- Customer, Consulting, Support and Engineering teams work closely hand in hand as one team

- AMOS Leads:
  - **Daniel Rodao -** Architecture & Innovation
  - **Miguel Angel Robles -** Application Servers

- Red Hat Leads:
  - **Brian Stansberry -** Engineering
  - **Brad Maxwell -** GSS NA
  - **Teresa Miyar -** GSS EMEA
  - **Ania Honess -** Customer Experience and Engagement
  - **Pedro Lopez -** Consulting
  - **Angel Ollé -** Consulting
  - **Carlos de la Flor -** Project Management
  - **Carles Valentines -** Services Delivery Manager

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CONCLUSIONS

Lessons Learned

- Automation is mandatory to manage such a huge infrastructure

- Red Hat JBoss EAP flexibility allows us to create a scalable platform

- Optimization and tuning have to be recurring activities to manage an infrastructure on this scale