

# Enabling DevOps with Pega7 at PayPal

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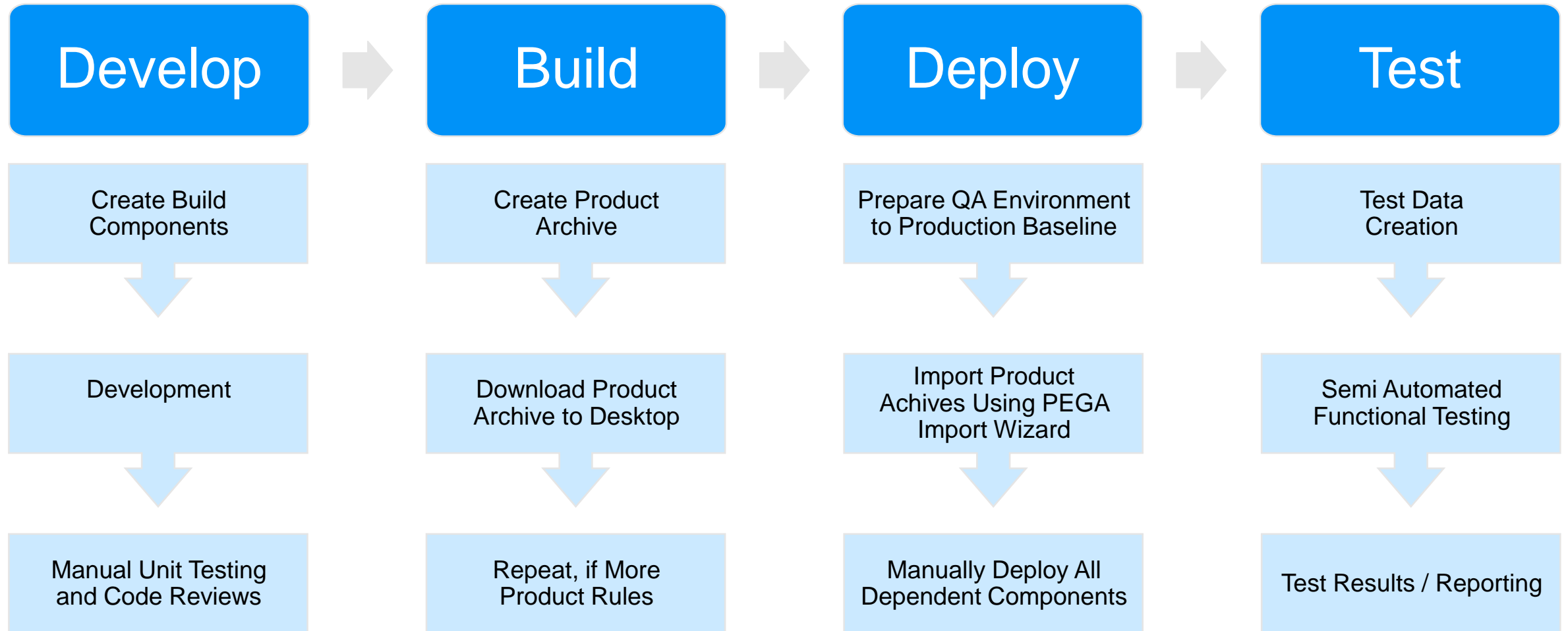


PEGAWORLD 2016

# PEGA Implementation in PayPal

- 3 main applications (7.1.7 version)
  - 20+ DEV scrum teams across different geographical locations
  - 100+ CI / RQA / GBC / Baseline stages
  - Monthly releases
    - Multiple releases in DEV / CQ in parallel
  - 10+ Data Centers (reduce by 3 in future)
    - 3-8 machines per DC
    - 4-8 JVMs per machine

# Before Continuous Integration



# DevOps Challenges

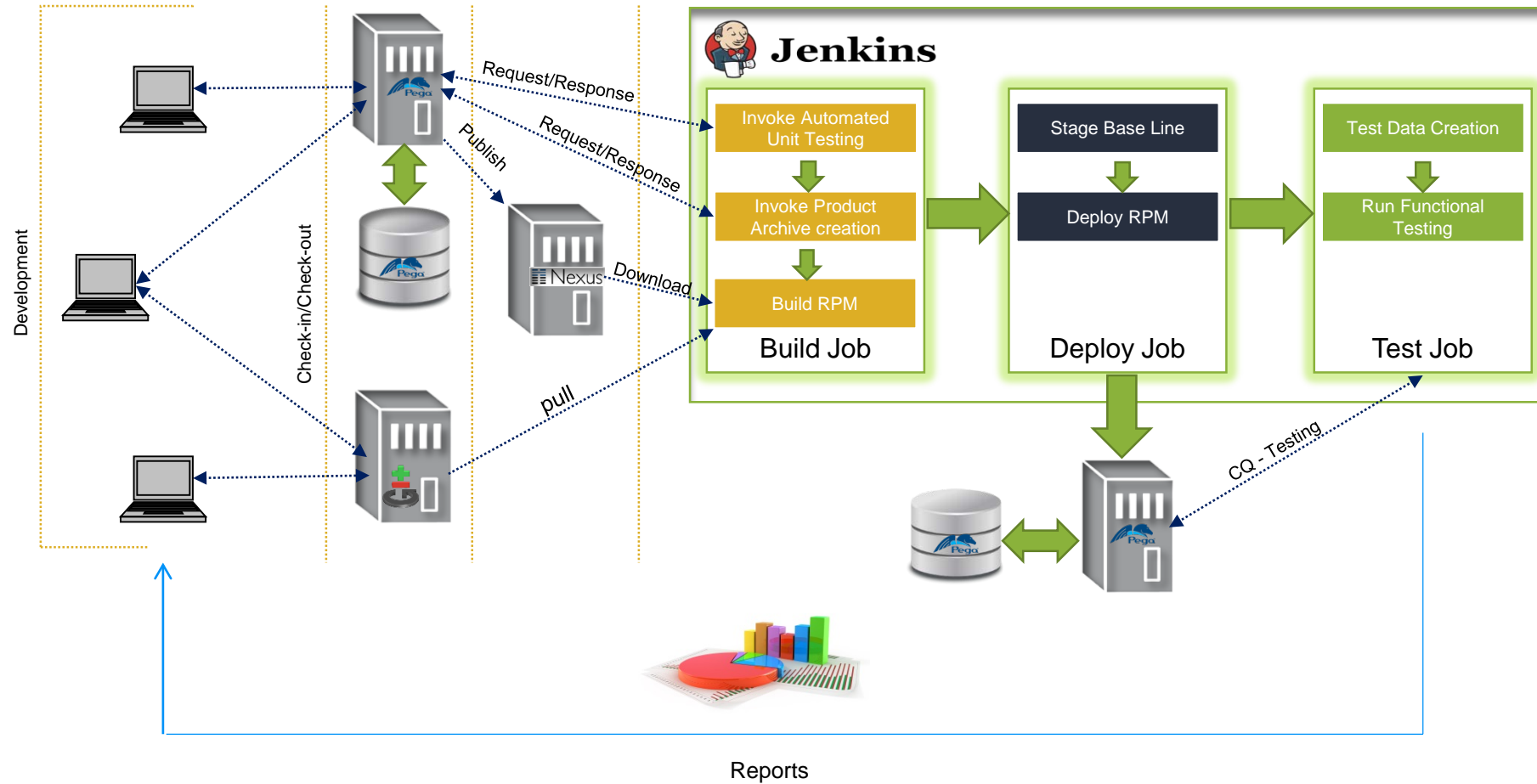
- How to automatically move code (rules) from DEV to CQ to PROD?
- How to manage and move support-peripheral applications across environments? (prpc-ear, library)
- How to streamline application testing and releases?
- How to ensure industry standard processes within PEGA?
- How to bring in a consistent model used across all PayPal applications and across all releases?

# CI Result – Benefits

- Daily CI for better code quality and stability during FQA, RQA
  - Integration issues discovered and resolved earlier
  - Enables agile: Last minute business requirement
- Faster Release cycles
  - All 3 applications are monthly releases
  - Parallel development of multiple releases, 2-4 average
- Streamline (reduce, if not eliminate) manual processes
- Consistent branching and naming conventions across all applications
  - Including RSV branching since it is automated
  - Reports and statistics for Leads & management

# CI IN PAYPAL

# CI – Summary / Visual

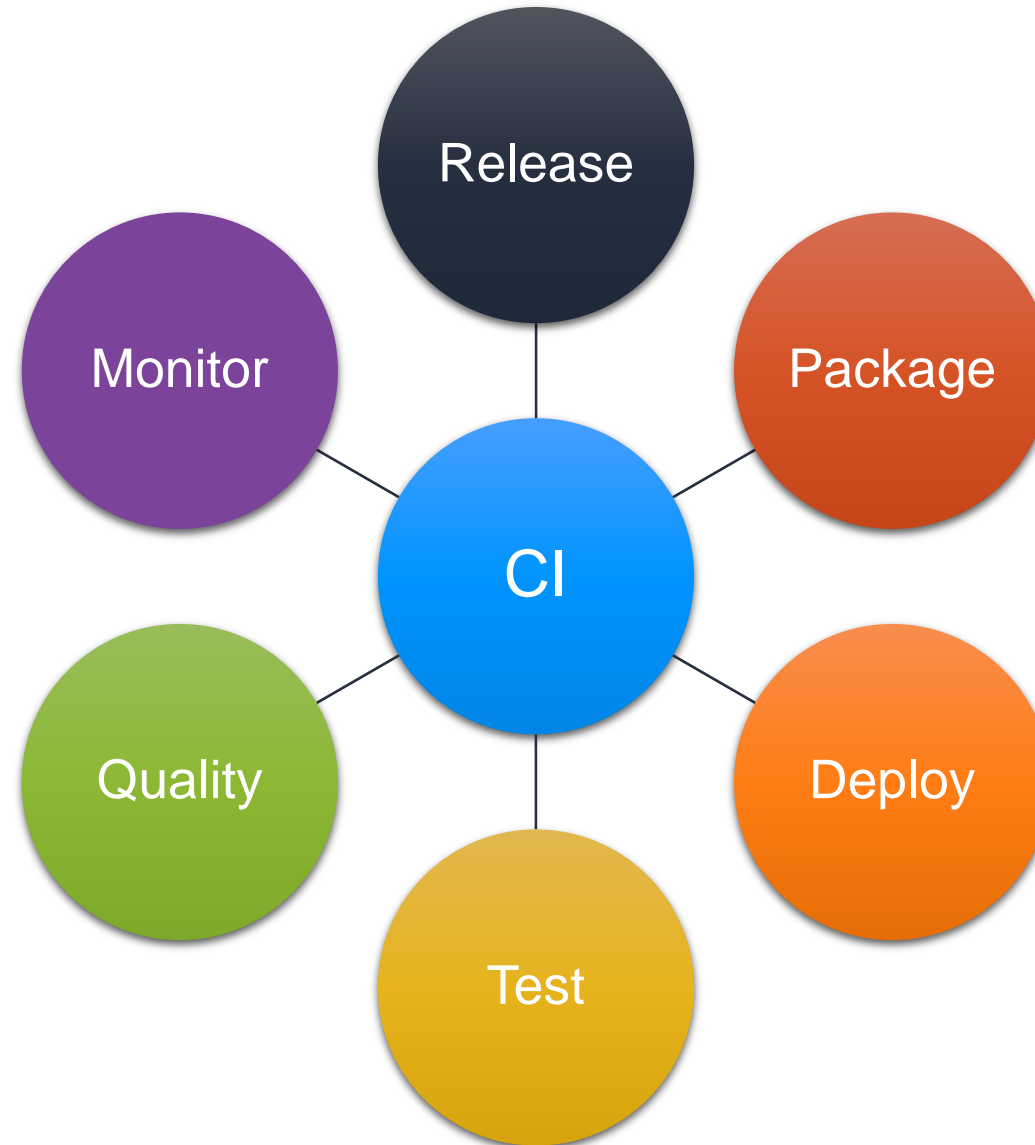


# CI Implementation – Considerations

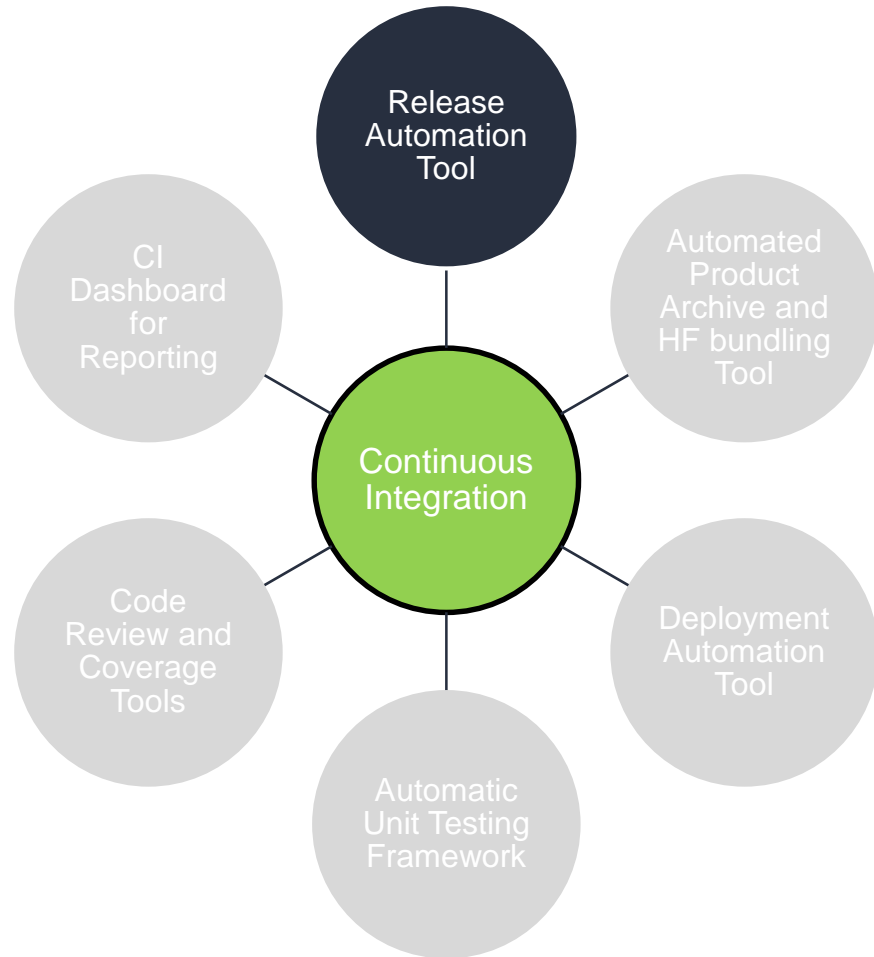
- RPMs for PROD Rollout – Integration with Enterprise systems
  - Jenkins (Continuous Integration Server)
  - GIT (Source Code Control System)
  - Nexus (Artifact Repository) – Everything considered as artifact
- Process Changes/Automation
  - Branching Strategy
  - Rules Import / Export
  - Governance around approvals



# CI Implementation in PEGA

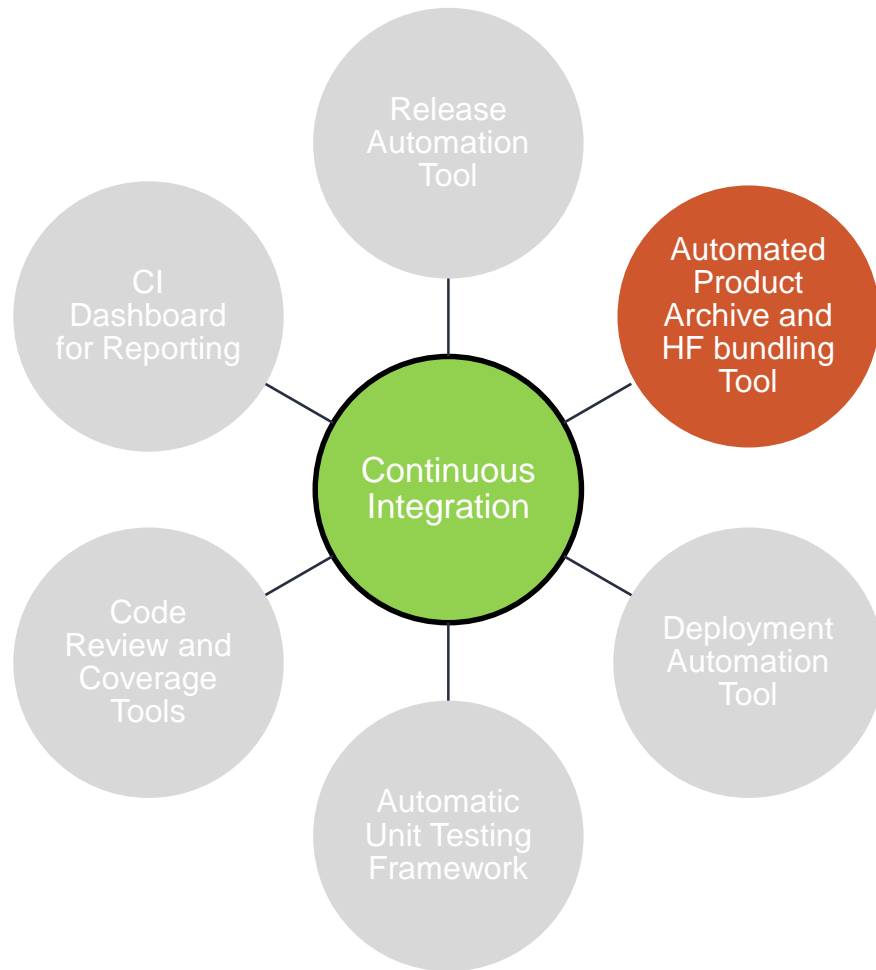


# Release Automation



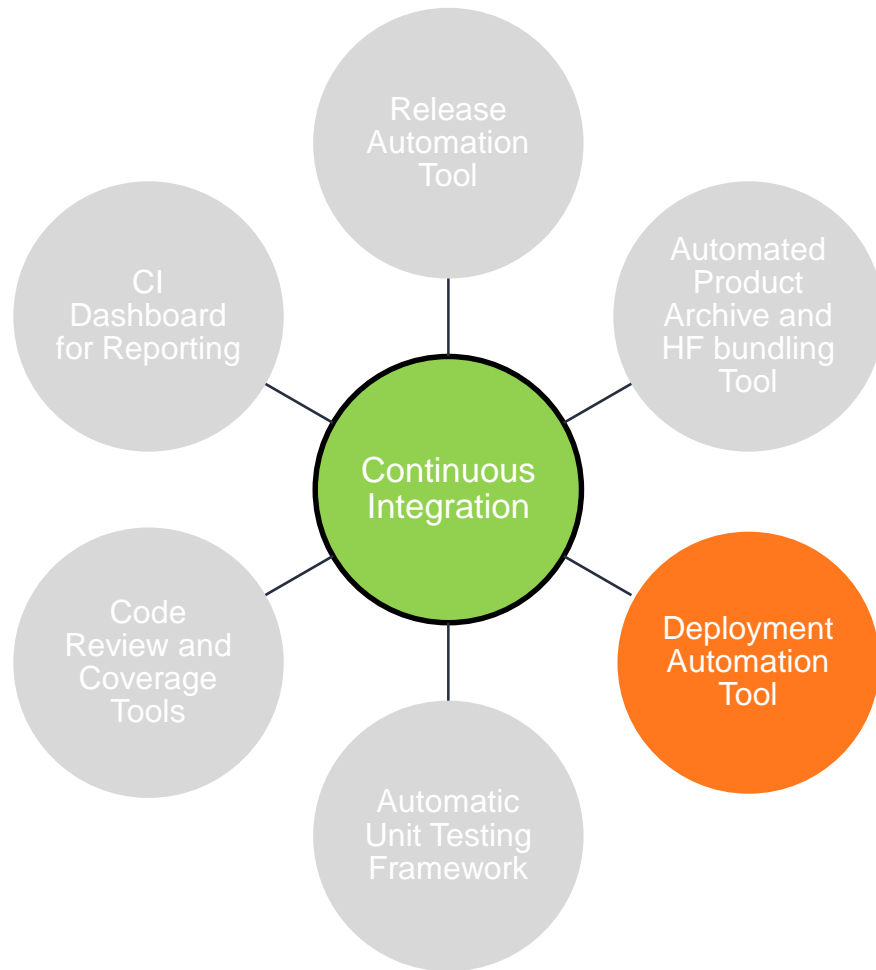
- Automates End-to-End release process, built as a flow in PEGA
- Access Control for different actors (Release Manager, Release Leads, Dev Leads, QA and COE)
- One stop place for all release (project) initiation activities including governance and oversight

# Product Archive Creation



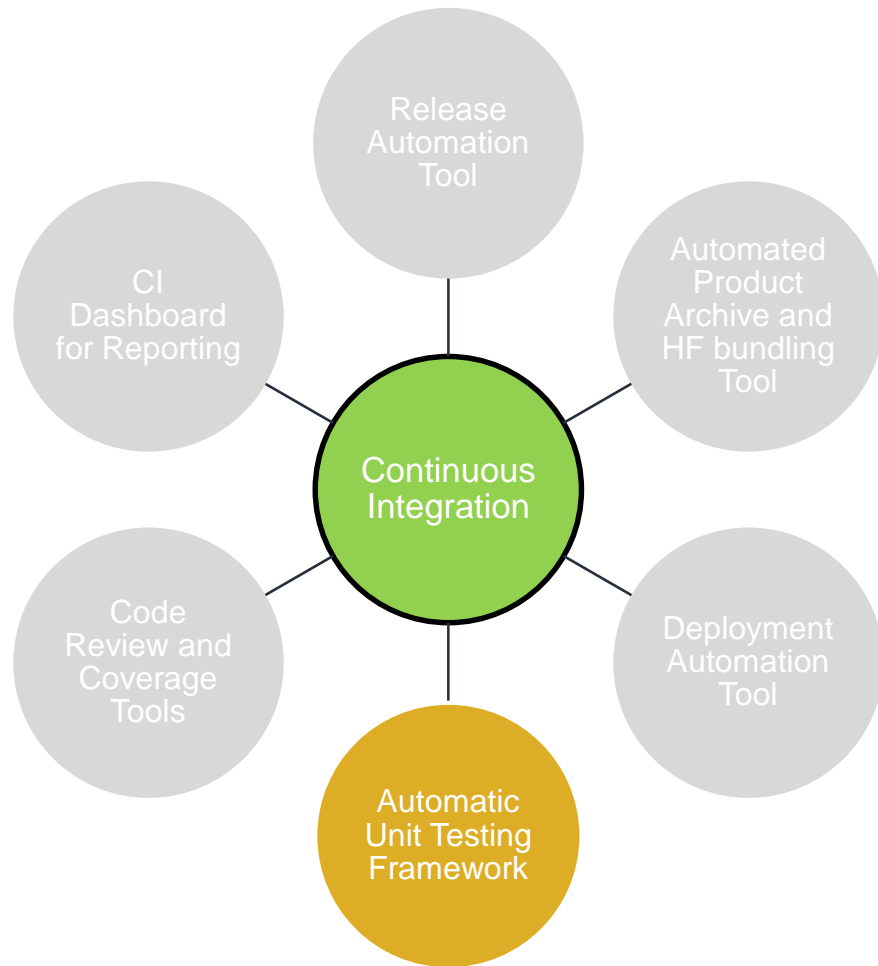
- REST service to automate creation of RAP and publish to NEXUS
  - Consistent versioning and naming convention across all applications
- Invoked directly from CI job (Jenkins Integration)
  - Part of daily CI job – Product Archive export is automated

# Deployment Automation Tool



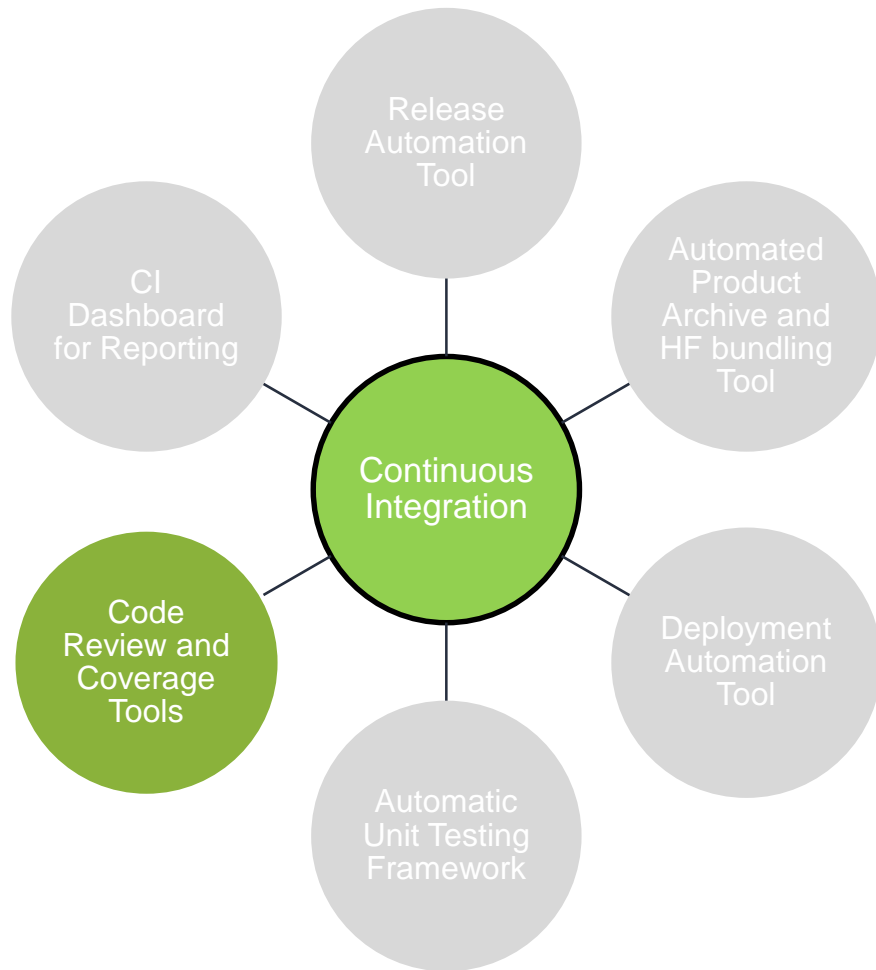
- Fully Automated deployment process
  - Rule Import & HF installation
  - EAR, WAR deployment / undeployment on application server (Weblogic)
  - JVM restarts
  - PEGA Cache clearing (DB & File System)
  - Same process across all applications
- Aligned with PayPal's RPM based deployment model

# AUT Framework



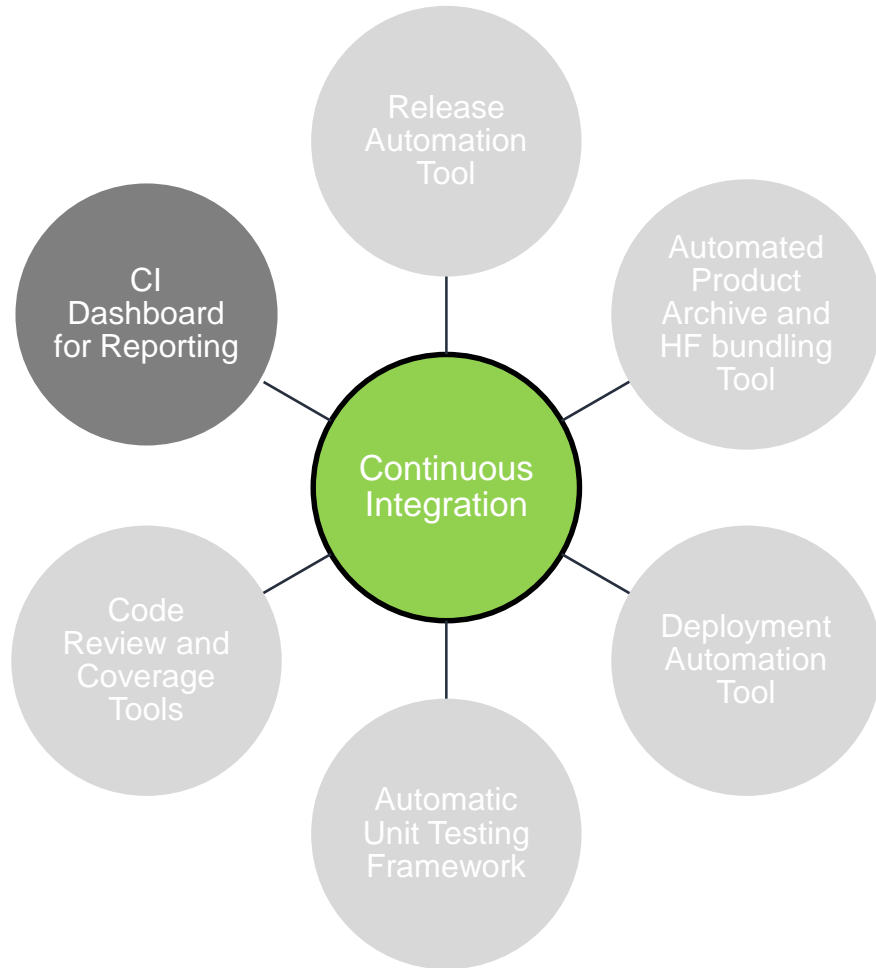
- Completely built in PEGA
- Portal for test case and test suite management
- Supports dynamic data feeding
- Created RESTful service to invoke test suites from CI job

# Code Coverage and Code Review Tools



- Functional Code Coverage metrics
  - JaCoCo (Java Code Coverage)
  - Important metrics for FQA sign off
- Code Review initiated with every check-in
  - Integrated with Rally (Agile tool)
  - US / DE associated with every rule check in
  - Reports generated per sprint – What percentage reviewed ?
    - Code Review traced at US / DE / Sprint level
  - Access control for different users – DTLs can review, submit, reports

# CI Dashboard



- JDBC call to get unit test data from PEGA DB
- Graphically represents trends of build, deploy, and test jobs
- More visibility to the scrum teams and management
  - Automated report generation

# SUMMARY



# CI implementation – Result

- Daily builds & deployments for all applications to CI box
  - Automated export of rules for the given application and publish to NEXUS
  - Automated publish of HotFixes into NEXUS
  - Automated build of GIT projects and publish to NEXUS (peripheral)
  - Packaging of Rules, HotFixes and all peripheral applications into deployable RPM
  - Automated deployment of individual artifact on ENV
  - Automated execution of test cases (AUT and functional)
  - Generation of Code Coverage reports
  - Report dashboard
- **Tools for automation & connected execution**