Pluggable Databases for DevOps

Making Individual Developer Databases a Reality

Session 476
Duane Dieterich
Amber Yancey

Pluggable Databases for DevOps
Presentation Attributes

- Session Type: Case Study
- Sub-Category: Dev/Ops (CiCD, Docker)
- Learning Objectives

  - Identify problem with development databases.

  - Show a solution using a build server and pluggable databases.

  - Identify lessons learned from implementation.
- Content Level: Mid-level. Discuss what users need to consider.
- Product Lines: Oracle Database, Oracle Database Multitenant, Docker
- Industry: Applicable to All
- Company Type: User (Oracle Database User)

Pluggable Databases for DevOps
About the Authors

- Duane Dieterich

  - Sr. PL/SQL Developer with Electronic Transaction Consultants, Dallas

  - Worked with Motorola, Database Consultants/Thinkspark, Enkitec, USAF, USAF Reserve, U.S. Army, USAA, and Southwest Research Institute.

  - First Oracle Database: Version 5 on HP 9000 330 server (HP/UX).

  - DMSTEX.com, RelDesGen.com, wtPLSQL.org, DTGen.org

- Amber Yancey

  - Integration Engineer with Electronic Transaction Consultants, Dallas

  - ETCC.com

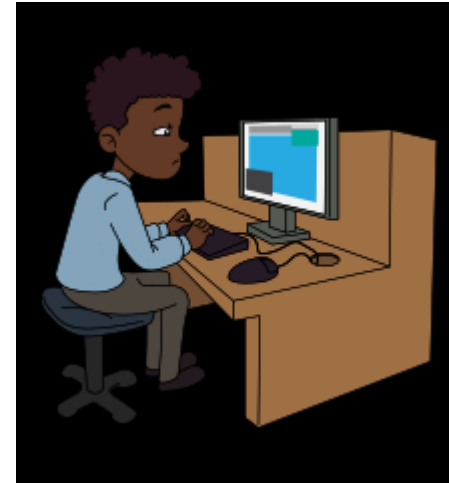# Pluggable Databases for DevOps
Agenda

- Problem with Development Databases
- Pluggable Database Implementation
- Lessons Learned

Problem with Development Databases

Problem with Development Databases
Shared Development Database Problems

- Mixed Versions of Database Objects
- Coordinating Multiple Changes to the Same Database Object
- Cross-Test Data Interference
- Catastrophic Test Failures
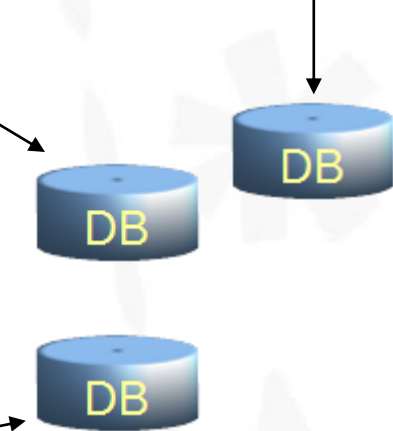- Database Server Unavailable

DEV DB

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Problem with Development Databases
Individual Development Database Problems

- Keeping Database Objects Current
- Rebuilding/Refreshing the Database
- Upgrading the Database Software (Oracle Patches)
- Keeping Adequate Test Data
- Local Database and Local Git Repository

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Pluggable Database Implementation

Pluggable Database Implementation
Database Source Code Capture

- Source Code Capture

  - Schema (DDL) and Data (DML) Capture

  - Populate an Empty Database

  - Installation Types

  - Single Installation Script Hiearchy

  - Database Utilities (SQL*Plus, SQLLDR)

  - Version Control System

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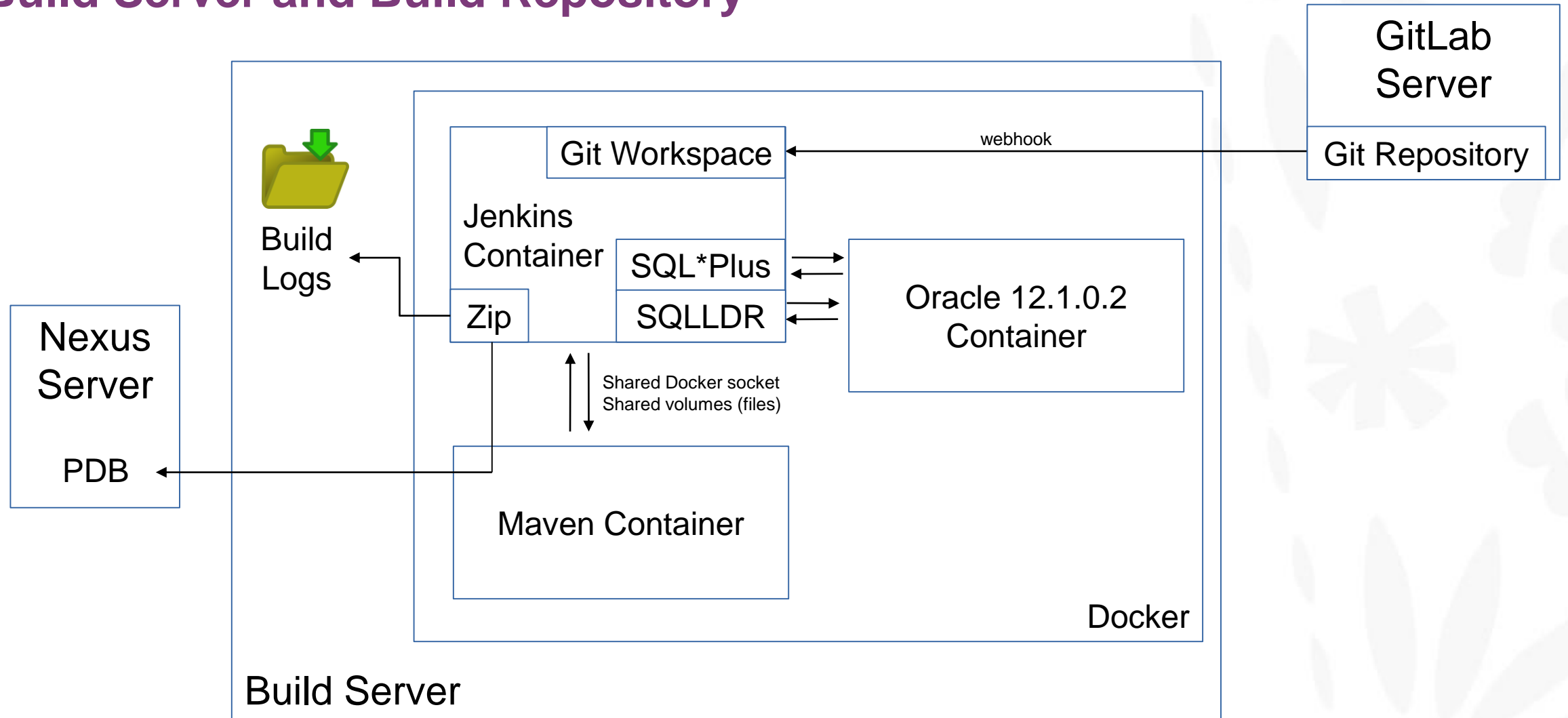# Pluggable Database Implementation
Version Control

- GitLab Server

  - Issue Tracker and Wiki

- Git Extensions

  - Clone, Stage, Commit, Push

- Git Hooks (Triggers)

  - post-receive.modify-new-branch-poms

  - pre-receive.01.lock-push-during-build

  - pre-receive.02.branch-name-check

  - pre-receive.03.pom-admin-check

- POM.XML Versions

Pluggable Database Implementation
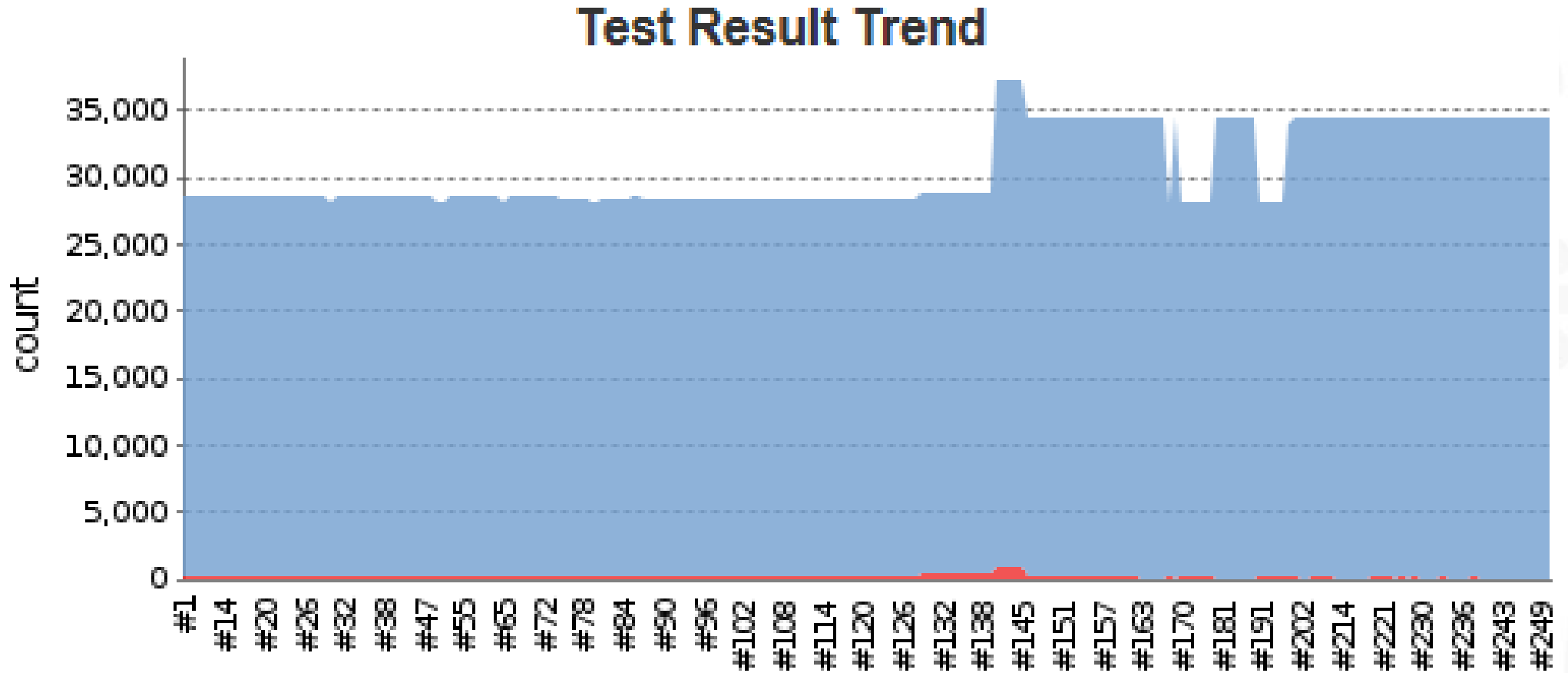## Build Server and Build Repository

Pluggable Database Implementation
Branch Builds in Jenkins

● **#227**   Feb 14, 2019 12:30 PM

[Artifact: rite-db-2.0.2-Install_type_stub-3e8b65f5]
Started by GitLab push by Prashanth Venoor

● **#226**   Feb 14, 2019 10:47 AM

[Artifact: rite-db-2.0.2-Core-Install_Type-cc56ce4a]
Started by GitLab push by Duane Dieterich

● **#225**   Feb 13, 2019 5:34 PM

[Branch: rite-db-2.0.2-Install_type_stub (new)]
Started by GitLab push by Prashanth Venoor

● **#224**   Feb 13, 2019 5:34 PM

[Branch: rite-db-2.0.2-RC1 (new)]
Started by GitLab push by Duane Dieterich

● **#223**   Feb 13, 2019 5:17 PM

[Artifact: rite-db-2.0.2-Install_type_tdat-962dc7a5]
Started by GitLab push by Prashanth Venoor

Pluggable Database Implementation
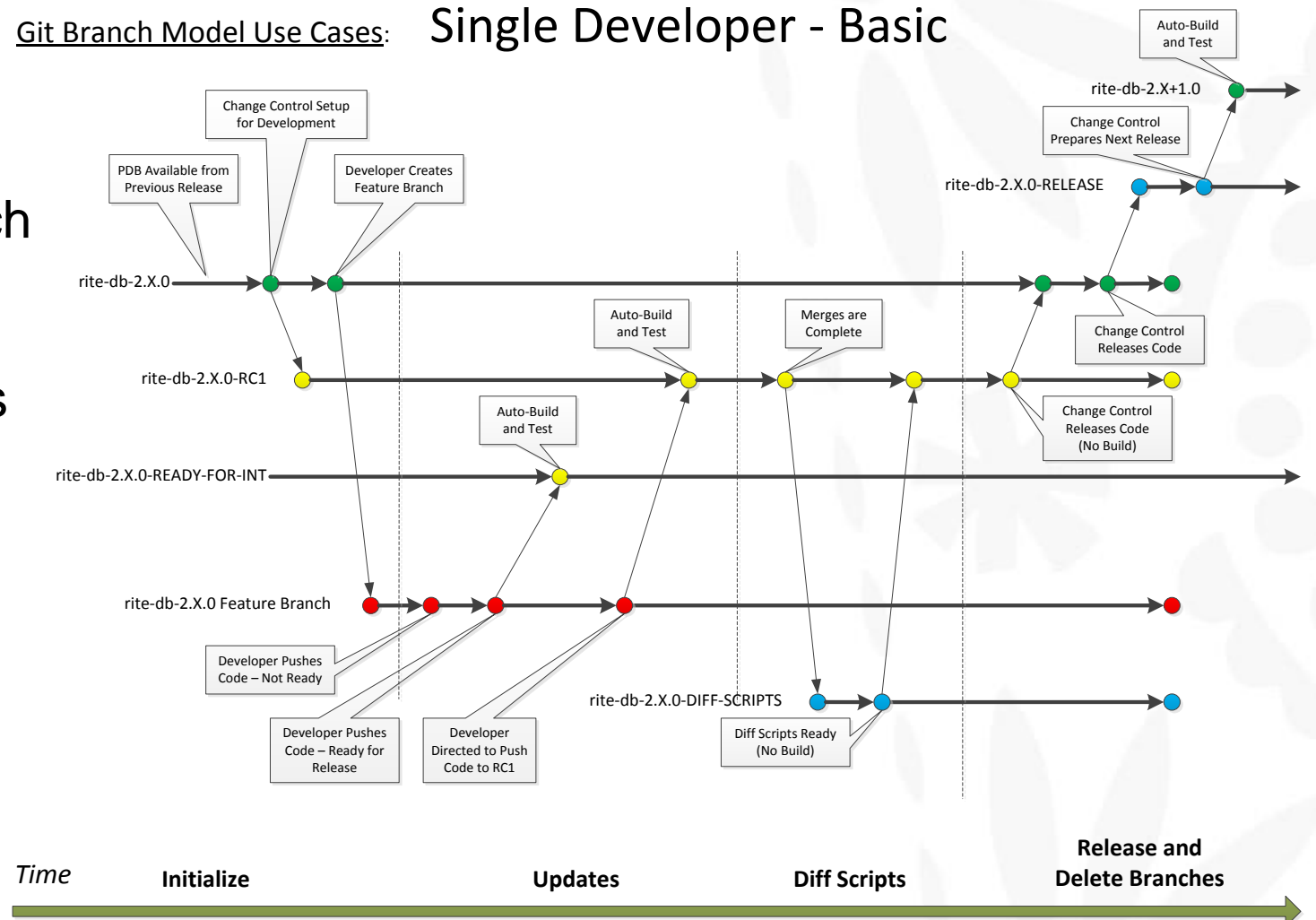## Test Results Trend in Jenkins

Pluggable Database Implementation
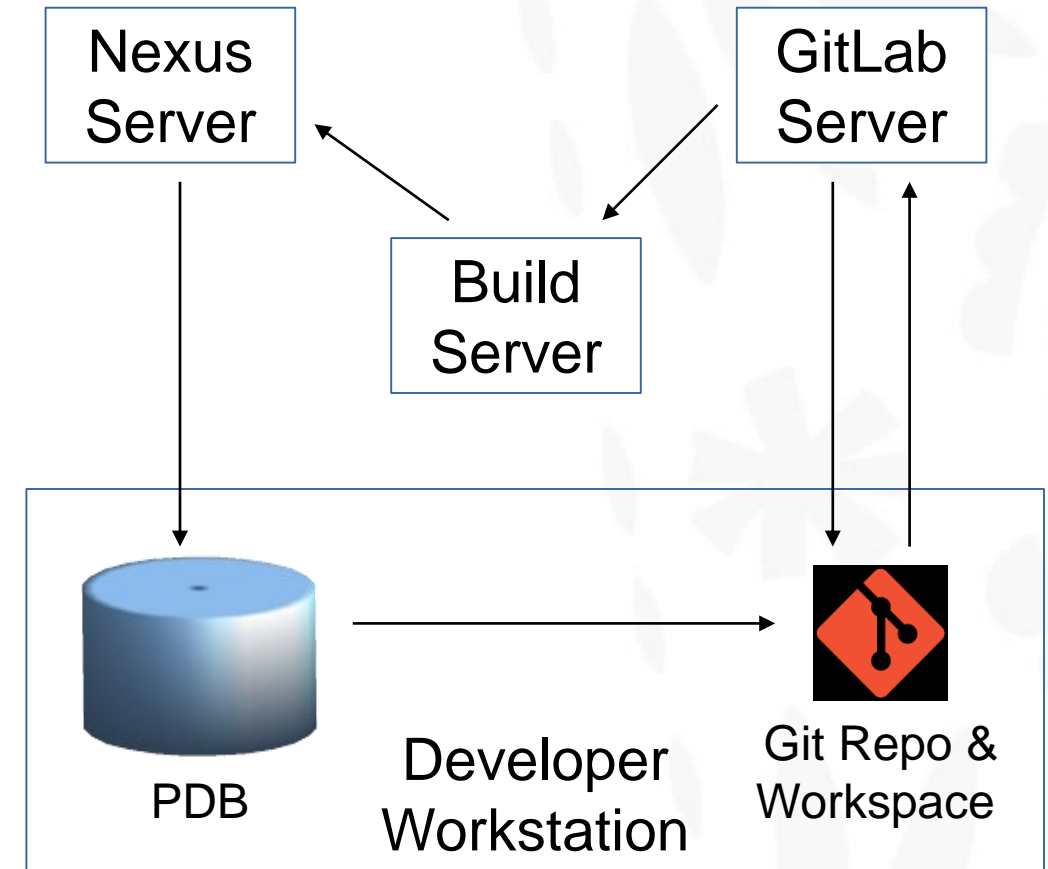## Branching Model

- Branching Model
  - Development (Default) Branch
  - Feature/Defect Branches
  - Release Candidate Branches
  - Release Branches

Git Branch Model Use Cases: Single Developer - Basic

Pluggable Database Implementation
Developer Workstations

- Workstation Components
  - Common Docker Containers
  - PDB (Reload Speed and Portability)
  - Source Code Capture
  - Git Working Trees

- Automation Scripts
  - Load PDB and Checkout Branch
  - Remove PDB and Checkout Branch
  - List Workspaces

Nexus Server

GitLab Server

Build Server

PDB

Developer Workstation

Git Repo & Workspace

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Lessons Learned

Lessons Learned
PDB Building (Server)

- Oracle Trace and Log Files

- Oracle 12.1 PDB Archive File

- Stubs and Loopback DB Links

- Preloaded Seed PDB

Lessons Learned
PDB Loading (Workstation)

- Matching PDBs to Branches

- UTL_FILE and Docker Shared Drives

- Oracle Embedded PL/SQL Gateway

- Re-compile Java VM

Lessons Learned
Developer Workstations

- Windows 7 and Docker

- Amazon Workspaces and Docker

- Oracle 12.1 Busy Datafiles

- Closed PDBs after Workstation Restart

- "No PDB" Branches for Worktrees

Lessons Learned
Developer Freedom

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Summary

- Problem with Development Databases
  - Shared Databases
  - Individual Databases
- Pluggable Database Implementation
  - Database Source Code Capture and Version Control
  - Build Server, Build Repository, and Branching Model
  - Workstation Components and Automation Scripts
- Lessons Learned
  - PDB Building and Loading
  - Workstation Challenges

- Pluggable Databases for DevOps

- Individual Developer Database Reality

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