Yocto Project® CI/CD Developer Workflow

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Introduction

- **Linux Infrastructure Lead at Wind River**

- **Maintain 100+ servers across 3 DC**

- **Current Challenge is improving Developer Productivity**

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Agenda

- **Wrigel Build System**

- **Yocto Developer Workflow Challenges**

- **DevBuilds and Build Failure Login**

- **Future Work**

Wrigel Build System

Rewriting Build Systems is Fun!

Wrigel the Third

- **Docker, Docker Swarm and Jenkins**

- **Designed for easy setup of small cluster**

- **Independent of Wind River network**

- **Internal builds and in AWS**

```
https://github.com/WindRiver-OpenSourceLabs/ci-scripts
```

Developer Workflow Challenges

- **"GitOps" tools assume a single Git repository**

- **How to manage collections of 40+ layers?**

- **How to support changeset across multiple repos?**

- **How to manage write access to git repositories?**

- **What configurations to build and test for a changeset?**

- **Shorten feedback loops and minimize co-ordination**

WR setup tool and git-repo

- **Git-repo manages large tree of repos**

- **Manifest generation by setup tool**

- **Pro: Git-repo detects changes across entire tree**

- **Pro: Automatic rebase of local commits when syncing**

- **Con: Fork with support for bare repositories**

Setup Tool and Layerindex

- **Discovery and dependency management**

- **Manages additional buildtools**

- **Integrated as** `bitbake-layers layerindex-fetch`

- **Setup can also integrate layers not in layerindex**

Developer Builds

also known as try builds

Developer Builds

- **Developer buildarea with local commits**

- **Repo detects commits**

- **"Fork" repos and store commits on Git server**

- **Containerized Layerindex uses forks**

- **Recreate local buildarea on build system**

Triggering Builds

- **What configurations? How many builds?**

- **Default set of configs and builds**

- **Select machine, image, distro, sdk**

- **local.conf override**

- **Live feedback and email summary**

- **For all options see:** `start_devbuild.sh`

Build Failure Login

For those nasty build failures

Build Failure Login

- **Save Docker Container Startup command**

- **Create temp ssh key and upload to build server**

- **Add authorized keys entry to run docker on login**

- **Build environment perfectly recreated**

- **Cleanup keys**

- **See workspace_login.sh**

Extensible Pipeline

- **OEQA tests on Qemu and Hardware using LAVA**

- **Test Failure Login**

- **Add more stages**

Summary

- **Expose large compute cluster to developers**

- **Build and test patches before commit**

- **Build failure inspection**

- **Integration with runtime testing**

Future Work

- **Yocto autobuilder helper scripts**

- **Using AWS to scale builds**

- **K8s and Tekton**

- **Yocto self-hosted AMIs**

THANK YOU!!