Automated testing of GNU Radio builds

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September 22, 2021
1. Introduction

2. Testing

3. Summary
What is the problem?

- GNU Radio runs on many different processors
- 32 and 64 bit architectures
- Dependencies can impact QA tests
- QA tests designed to run at build time
- But cross built tests can’t run on build machine
OpenEmbedded (Yocto Project technical partner)
- Build custom Linux distributions
- Supports QEMU
- SBOM (Software Bill of Materials) support in development

Key principle, keep applications separate from machine and distribution

Fetches sources, compiles, create packages (ipk, rpm, deb)

Images are assembled from packages
Package QA testing

- QA tests are typical run at build time
- Care is taken to use newly built libraries
- If you are cross compiling, this doesn’t work
- This can be worked around
- OpenEmbedded supports the concept of packaging test code
Packaging test code

do_install_patest() {
    mkdir -p ${D}${PTEST_PATH}
    cd ${B}
    find . -name "qa*sh" -exec cp --parents \ 
           {} ${D}${PTEST_PATH} \;
    find . -name "CTestTestfile.cmake" -exec 
           cp --parents {} ${D}${PTEST_PATH} \;
    cd ${S}
    find . -name "qa*py" -exec cp --parents \ 
           {} ${D}${PTEST_PATH} \;
}
Running the test code

#!/bin/sh

cctest CTestTestfile.cmake
Collecting and displaying results

- Results are collected in a text file
- Results file is commited to git repository
- We use the diff to track changes in test results!
- But, we have to postprocess results to eliminate noise.
Results

57/207 Test #57: qa_rms ............... Passed
Start 58: qa_rotator_cc
- 58/207 Test #58: qa_rotator_cc ...... Passed
+ 58/207 Test #58: qa_rotator_cc ......***Failed
Start 59: qa_sample_and_hold
59/207 Test #59: qa_sample_and_hold . Passed
Links

- https://www.openembedded.org
- https://www.yoctoproject.org
- https://github.com/balister/meta-sdr
- https://github.com/balister/gnuradio-ptest