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## 1.0 Introduction

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With the Clean as You Code approach to code quality, your focus is always on new code, which is the code that was added and changed from your previous version. You must ensure that your new code is clean and safe.

To view code coverage results for the new and changed code for your z/TPF project, you must first run a baseline scan and create the project in SonarQube. SonarQube identifies new and changed code by comparing the baseline scan and any scans that follow.

The steps in the following sections walk you through creating the baseline, running a code coverage, and then running a scan to import the code coverage results. A link to SonarQube is also provided for you to view the new code analysis. You can then identify how much your new and changed code is covered by tests and any code execution paths that you might have missed.

## 2.0 Change history

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- 20210205 Initial version
- 20210218 Added Git server as a prerequisite
- 20210329 Update in retrieving the regKey from jsonResponse due to change in ccv start service in apar PJ46420.

## 3.0 Prerequisites

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- Ensure that APARs PJ46334 and PJ46420 are applied on your z/TPF system.
- Deploy z/TPF scriptable code coverage services on the z/TPF test system.
- Configure and start the tpfccv service.
- Install SonarQube with SonarQube C++ plugin (Community). You are not required to install it on IBM on Linux on Z.
- On Linux on Z, install SonarScanner , and configure it to connect to the SonarQube server by editing the sonar-scanner.properties file.
- On Linux on Z, install Python 3.4 or later with the following Python modules: argparse, configparser, getpass, json, os, requests, subprocess, sys, textwrap, time

- On Linux on Z, install the Git server

## 4.0 Installation

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- 1) Use FTP to transfer the `tpfNativeCodeCoverage.tar.gz` to your linux on Z system. You can place the file in any directory as a holding location,

for example: `/tmp/ztpftar`

- 2) Create a root directory to hold the extracted files,

for example: `/ztpfertools`

- 3) Extract the files from the `tpfNativeCodeCoverage.tar.gz` file by entering the following commands:

```
cd /ztpfertools
tar -xvzf /tmp/ztpftar/tpfNativeCodeCoverage.tar.gz
```

The extracted files are in the following directory structure:

```
tpfNativeCodeCoverage
|
|-- tpf_run_native_ccv.properties
|
|-- tpf_run_native_ccv.py
|
`-- tpf_scan_project.py
```

- 4) Verify that the read and execute permissions are set for these files.

For example, enter the following command to set read and execute permissions for all users:

```
chmod -R 755 tpfNativeCodeCoverage
```

## 5.0 Customizing the scripts

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Edit the `tpf_scan_project.py` file to update the value for the `sonarScanner` variable with the correct path to where your `sonarScanner` is installed.

## 6.0 Running the scripts

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- 1) Open the command line interface, and change the current directory to the TPF project directory:

```
cd /home/<user_id>/<tpf_project_directory>
```

- 2) Copy the `tpf_run_native_ccv.properties` file in to your TPF project directory from the scripts location.

- 3) Edit the `tpf_run_native_ccv.properties` file to update the values for the z/TPF test system and TPF project specific variables.

- 4) Enter the following command to run the baseline sonar scan on your project:

```
tpf_scan_project.py
```

- 5) Check your SonarQube dashboard to verify the project was created by using the URL that was displayed after the baseline scan in the previous step.

- 6) Make code updates to your project source, and build and load your project to your z/TPF test system.
- 7) Enter the following command to start code coverage on your z/TPF test system:  

```
tpf_run_native_ccv.py start
```
- 8) Run your tests on your z/TPF test system.
- 9) Enter the following command to stop code coverage on your z/TPF test system:  

```
tpf_run_native_ccv.py stop
```
- 10) Enter the following command to get the formatted code coverage result file in Cobertura format from your z/TPF test system:  

```
tpf_run_native_ccv.py get
```
- 11) Enter the following command to run the Sonar scan on your project:  

```
tpf_scan_project.py
```
- 12) Check your SonarQube dashboard to verify that the project displays new code stats by using the URL that was displayed after the scan in the previous step.
- 13) Repeat steps 6 to 12 as often as needed.

## 7.0 Known problems and workarounds

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- 1) Sometimes you might receive a 400 HTTP status with a native code coverage get operation if the stop code coverage post processing is still in progress. So, for the get operation to be successful, you need to wait for a few seconds after the stop operation before you perform the get operation. To prevent the get operation from failing, you can adjust the `seconds_to_sleep` variable in the `tpf_run_native_ccv.py` file.
- 2) If you need to run a baseline scan again for your project, complete the following steps:
  - a) Delete the following files from your project directory:

```
sonar-project.properties  
.git  
.scannerwork
```
  - b) Delete the project from SonarQube. This action requires the administrator privilege for the SonarQube server.
  - c) Run the baseline scan again.

## 8.0 Other sources of information

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- 1) IBM z/TPF Knowledge Center: <https://www.ibm.com/support/knowledgecenter/en/SSB23S>
- 2) SonarQube and SonarScanner: <https://www.sonarqube.org/>
- 3) SonarQube C++ plugin (Community): <https://github.com/SonarOpenCommunity/sonar-cxx>
- 4) Cobertura format: <http://cobertura.sourceforge.net/xml/coverage-04.dtd>
- 5) Git server: <https://git-scm.com/>

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