Steps to instrument and build Android

This section provides step by step instructions to download and build Android source with AspectJ instrumentation.

1. Establish build environment and Download Android source

1. Establish your environment
   Follow instructions on Android source page to establish a build environment: https://source.android.com/source/initializing.html

2. Install Repo
   i. Create a `bin/` directory in your home directory and make sure that it is included in your path:
   ```
   $ mkdir ~/bin
   $ PATH=~/bin:$PATH
   ```

   ii. Download the Repo tool and ensure that it is executable.

   ```
   $curl https://storage.googleapis.com/git-repo-downloads/repo >
         ~/bin/repo
   $ chmod a+x ~/bin/repo
   ```

3. Create an empty directory to hold your working files.

   ```
   $ mkdir Working_Directory
   $ cd Working_Directory
   ```

4. Configure git with your name and email address.

   ```
   $ git config --global user.name "Your Name"
   $ git config --global user.email "you@example.com"
   ```

5. Initialize repo with the following command. (for a different version, provide a branch name with -b option. For a list of branches, see Source Code Tags and Builds.

   For example,
   ```
   $repo init –u
   https://android.googlesource.com/platform/manifest -b android-
   2.3.7_r1
   ```

6. Download Android source
   To pull down the Android source tree to your working directory from the repositories as specified in the default manifest, run

   ```
   $ repo sync
   ```

This step may take a couple of hours depending upon network speed.

7. Download folder "`instrumentation_tool`" from git repository into `Working_Directory`

```
$git clone
https://github.com/poojakanchan/instrumentation_tool.git
```

8. Apply patch to the build files. Make sure you take a backup before making the changes. Provide execution permissions to the scripts in the `instrumentation_tool` folder.

```
$cp  build/core/definitions.mk build/core/definitions_bak.mk
$ patch build/core/definitions.mk <
instrumentation_tool/definitions.patch
$ chmod +x instrumentation_tool/*.sh
```

2. Build Android source with custom aspects

1. Write custom aspects and place them in the `src/` folder. (Example Aspect class "`TestAspect.java`" is provided) The files under the `src/` folder are automatically compiled and injected by the Instrumentation tool while running a build.

2. Initialize environment

```
$ export ANDROID_HOME=<path to Working_Directory>
$ source build/envsetup.sh
$ lunch
```

3. Build Android source

```
$make showcommands
```

To redirect logs to a log file, run

```
$make showcommands 2>&1 | tee log_file
```

To use multiple threads, run it with -j option as

```
$ make -j4
```

Note that, building the source may require up to 2-3 hours.

4. After the build is successful, launch an emulator using the command:

```
$ emulator
```

To see adb logs, use command:

```
$ adb logcat
```