

Benchmark

The idea of this project is to create a native Android service and a Java Android application that will measure the write speed to external storage (SD card). In Android only root and media user groups have the permission to write to external storage. Create 2 applications that will use Android IPC (binder) mechanism that will allow user application to bypass this limitation of Android operating system.

Binder interface needs to own one method **exec** which will be used to execute Android shell commands sent from Java application in a root native service. The root service will execute the received command by calling `system(char * command)` function that is available with inclusion of `stdlib.h` header.



Figure 1 – Connection between native service and Java application

Example of suggested algorithm used to determine the write speed on external storage:

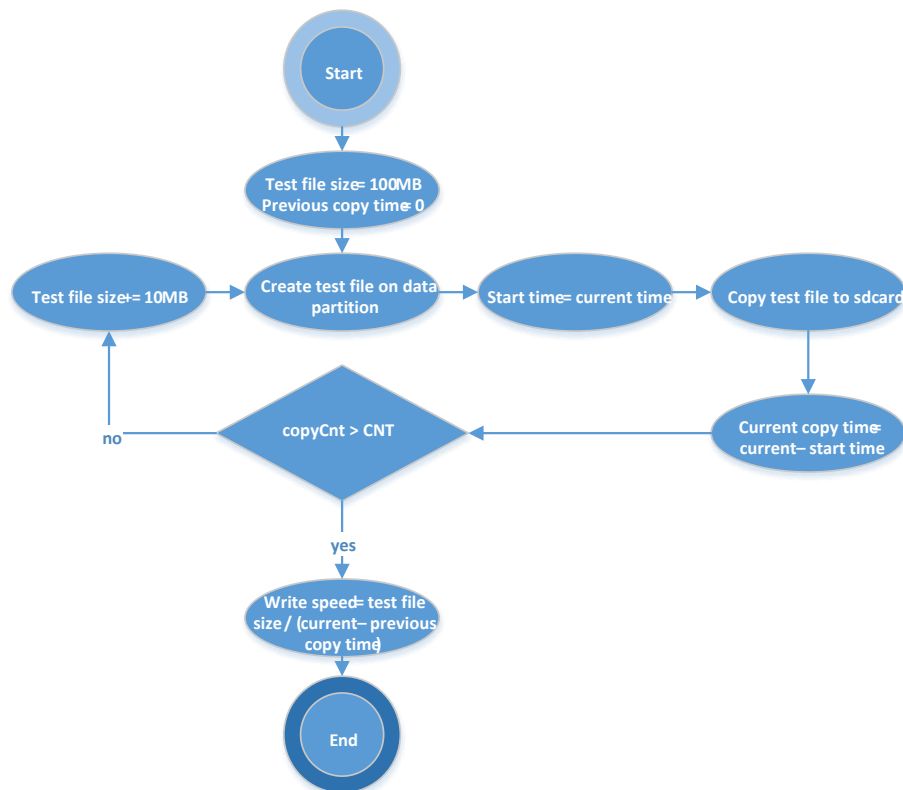


Figure 2 Sample algorithm used to calculate write speed

To create test file and copy you can use dd tool:

```
dd if=/dev/zero of=/data/data/com.course.benchmarkapplication/files/testfile  
bs=1 count=1 seek=104857600
```

Tasks

1. Create a native service that will be started automatically on Android startup and ensure it has root privileges.
2. Create an Android Java application and connect it over binder mechanism with native service.
3. Inside native service, create one binder method (exec) which will receive string argument and execute that argument with system function call from stdlib.h.
4. Implement a benchmark algorithm in Java application that will call exec method to determine wrote speed to external storage (SD card in this case).
5. Once benchmark is complete, show the speed in Android application UI.
6. Pay attention and add protection about corner cases in application (prevent crashes, de-init properly, etc.)
7. As a result, submit source code of all the changes and screenshot showing benchmark results.
8. Use Android emulator for development and testing.