Field Application Note
on
Replacing Software Executables

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PREPARED FOR

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Field Application Note

on

Replacing Software Executables

Azcom Technology

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REVISION HISTORY

Rev.	Date	Author	Reviewed	Description
1.0	23rd July 2019	Sukhvinder		First revision.

1. Introduction

1.1 Purpose

This document describes the procedure to replace one or more executables (binary files) locally in the Azcom eNodeB system. By "locally" it is meant that the executable is directly replaced at its destination without following the rigorous method described in appropriate User Manual or Build Instruction Manual, etc.

The procedure described in this note should be executed only under the exceptional circumstances upon specific advice of Azcom Customer Support.

In all but specific exceptional situations, the system loading procedures described in Azcom eNodeB User Manuals should be followed.

1.2 Audience

The users of this field application note are Azcom Customer Support and customer's field personnel working under specific directions of Azcom Customer Support.

1.3 Applicability

The Azcom eNodeB system uses a number of executables (binary files). The procedure described in this application note should be used to replace ONLY SOME of the executables, as listed below:

List of executables that CAN BE replaced using the procedure described:

- dsp-core0.out
- dsp-core1.out
- dsp-core2.out
- dsp-core3.out
- eNB.bin
- lteSharedinfo.bin

List of executables that CAN NOT BE replaced using the procedure described:

- azOamAgent.bin
- Etbdump
- loadnetfp.bin
- msgrouter.bin
- oam_rf.bin
- storageManager
- SharedMemoryManager

2. Procedure to Replace Layer2 & Layer1 Executables

Use the following procedure to replace Azcom LTE eNodeB protocol stack Layer 1 and Layer 2 executables.

Step 1: Depending on the duplex mode selected, e.g. FDD or TDD, copy dsp-core<x>.out to the ***/lib/firmware/fdd/*** or ***/lib/firmware/tdd/*** folder. See illustrations below.

For FDD System

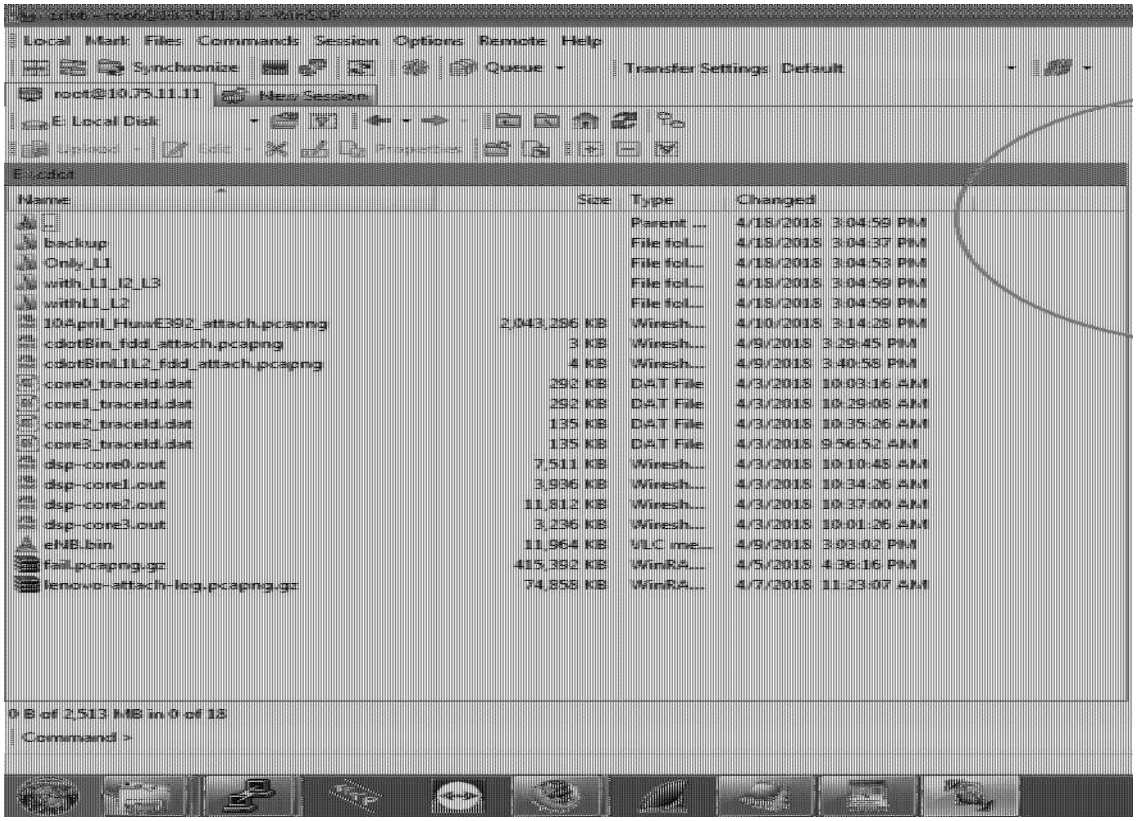

Figure 1: Transferring executables for FDD

```
root@AZB_NC0M_4300:/lib/firmware/fdd# ls -ltr
-rw-rw-r--    1 root     root       3309584 Apr  5  2018 dsp-core3.out
-rw-rw-r--    1 root     root      12096896 Apr  5  2018 dsp-core2.out
-rw-rw-r--    1 root     root       4060660 Apr  5  2018 dsp-core1.out
-rw-rw-r--    1 root     root       7684008 Apr  5  2018 dsp-core0.out
root@AZB_NC0M_4300:/lib/firmware/fdd#
```

Figure 2: Listing of FDD directory

For TDD System

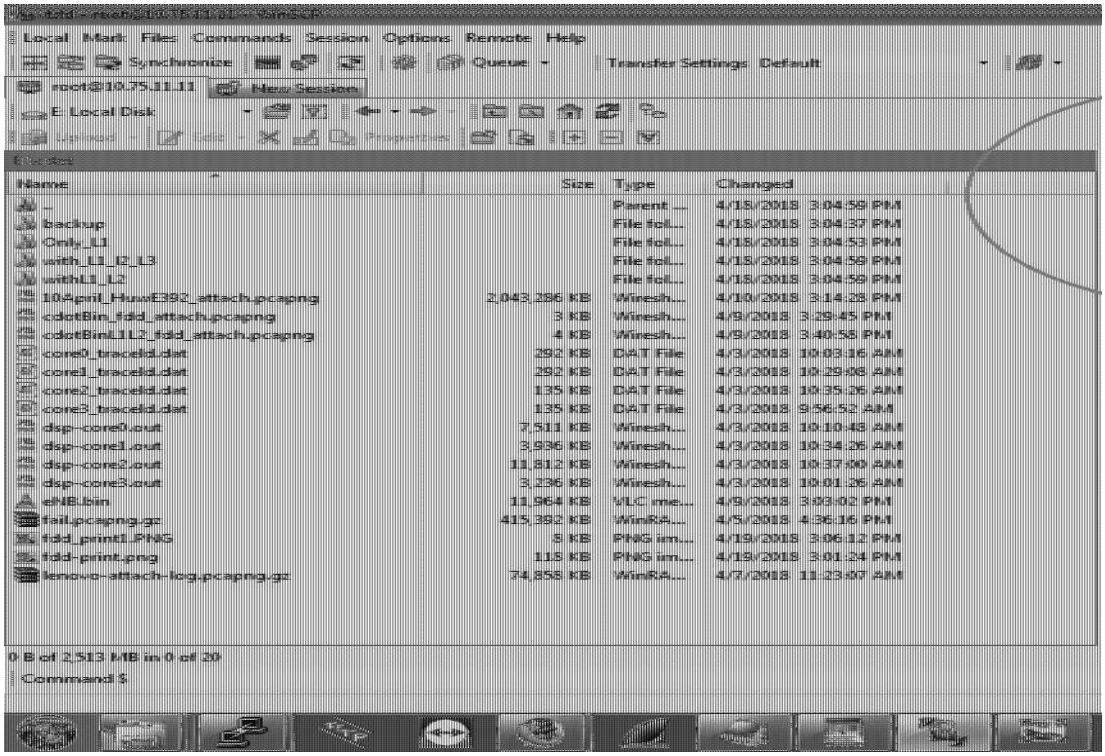

Figure 3: Transferring executables for TDD

```
root@AZB_NCOM_4300:/lib/firmware/tdd# ls -ltr
-rw-rw-r--    1 root     root       3349772 Apr  5  2018 dsp-core3.out
-rw-rw-r--    1 root     root      12122192 Apr  5  2018 dsp-core2.out
-rw-rw-r--    1 root     root       4239528 Apr  5  2018 dsp-core1.out
-rw-rw-r--    1 root     root       7684008 Apr  5  2018 dsp-core0.out
root@AZB_NCOM_4300:/lib/firmware/tdd#
```

Figure 4: Listing of TDD directory

Step 2: Use an editor, to add the absolute path of these replaced executables in the following file:

/mnt/csc/packages/actual/0.package.cfgfiles

See Figures 5 and 6.

For FDD System

```
root@AZB_NCOM_4300:~# vi /mnt/csc/packages/actual/0.package.cfgfiles
/etc/oam/config_database_SR_TX_Div.db3
/etc/oam/band.conf
/etc/oam/log.conf
/etc/oam/network.conf
/etc/oam/axcoffset.conf
/etc/oam/examples/external_epc_network.example
/etc/oam/examples/nib_network.example
/etc/oam/examples/log.example
/etc/init.d/oam_aif2link.sh
/var/net-snmp/data/RRH
/var/net-snmp/data/nodeName
/var/net-snmp/data/cellConfig
/var/net-snmp/data/swmParams
/var/net-snmp/data/swmImageTable
/var/net-snmp/data/rrhaw2sTxSigPathEutraTable
/var/net-snmp/data/rrhaw2sRxSigPathEutraTable
/var/net-snmp/data/rrhaw2sSoftwareMgmt
/var/net-snmp/data/rrhaw2sRemoteAddress
/etc/oam/uri.conf
/lib/firmware/fdd/dsp-core0.out
/lib/firmware/fdd/dsp-core1.out
/lib/firmware/fdd/dsp-core2.out
/lib/firmware/fdd/dsp-core3.out
I /mnt/csc/packages/actual/0.package.cfgfiles [Modified] 28/28 100%
```

Figure 5: Adding absolute path for FDD

For TDD System

```
root@AZB_NCOM_4300:~# vi /mnt/csc/packages/actual/0.package.cfgfiles
/etc/oam/config_database_SR_TX_Div.db3
/etc/oam/band.conf
/etc/oam/log.conf
/etc/oam/network.conf
/etc/oam/axcoffset.conf
/etc/oam/examples/external_epc_network.example
/etc/oam/examples/nib_network.example
/etc/oam/examples/log.example
/etc/init.d/oam_aif2link.sh
/var/net-snmp/data/RRH
/var/net-snmp/data/nodeName
/var/net-snmp/data/cellConfig
/var/net-snmp/data/swmParams
/var/net-snmp/data/swmImageTable
/var/net-snmp/data/rrhaw2sTxSigPathEutraTable
/var/net-snmp/data/rrhaw2sRxSigPathEutraTable
/var/net-snmp/data/rrhaw2sSoftwareMgmt
/var/net-snmp/data/rrhaw2sRemoteAddress
/etc/oam/uri.conf
/lib/firmware/tdd/dsp-core0.out
/lib/firmware/tdd/dsp-core1.out
/lib/firmware/tdd/dsp-core2.out
/lib/firmware/tdd/dsp-core3.out
I /mnt/csc/packages/actual/0.package.cfgfiles [Modified] 28/28 100%
```

Figure 6: Adding absolute path for TDD

Step 3: Use an editor to update the file "***/etc/init.d/swinc***" and comment the following lines:

 # while true; do

 # sleep 1

 # done

See Figure 7.

```
root@AZB_NCOM_4300:~# vi /etc/init.d/swinc

do_log()
{
        status=$1
        message=$2
        error_string=$3

        if [ $status -eq 0 ]; then
                echo "[PASSED]"
                echo "$DATE $message Software Integrity PASSED"
        else
                echo "[FAILED]"
                echo "$DATE $message Software Integrity FAILED"
        #       while true; do
        #               sleep 1
        #       done
        fi
}

case "$1" in
    start)
        # Crete log file if not exists
I /etc/init.d/swinc [Modified] 65/97 67%
```

Figure 7: Editing swinc file

Step 4: Use an editor, to add the absolute path of the updated ***swinc*** file in the following file:

/mnt/csc/packages/actual/0.package.cfgfiles

See illustration below.

```
root@AZB_NCOM_4300:~# vi /mnt/csc/packages/actual/0.package.cfgfiles
/etc/oam/band.conf
/etc/oam/log.conf
/etc/oam/network.conf
/etc/oam/axcoffset.conf
/etc/oam/examples/external_epc_network.example
/etc/oam/examples/nib_network.example
/etc/oam/examples/log.example
/etc/init.d/oam_aif2link.sh
/var/net-snmp/data/RRH
/var/net-snmp/data/nodeName
/var/net-snmp/data/cellConfig
/var/net-snmp/data/swmParams
/var/net-snmp/data/swmImageTable
/var/net-snmp/data/rrhaw2sTxSigPathEutraTable
/var/net-snmp/data/rrhaw2sRxSigPathEutraTable
/var/net-snmp/data/rrhaw2sSoftwareMgmt
/var/net-snmp/data/rrhaw2sRemoteAddress
/etc/oam/ori.conf
/lib/firmware/fdd/dsp-core0.out
/lib/firmware/fdd/dsp-core1.out
/lib/firmware/fdd/dsp-core2.out
/lib/firmware/fdd/dsp-core3.out
/etc/init.d/swinc
I /mnt/csc/packages/actual/0.package.cfgfiles [Modified] 29/29 100%
```

Figure 8: Adding absolute path for swinc

Step 5: Use the command "***configuration save all***" to make the changes persistent. See illustration below.

```
root@AZB_NC0M_4300:~# configuration save all
Wait for other configuration commands           [DONE]
Create working directory                        [DONE]
Add Platform configuration files:
 /etc/network/interfaces
 /etc/oam/rf.conf
 /var/net-snmp/snmpd.conf
 /usr/share/snmp/snmpd.conf
[DONE]
Add Layer 0 configuration files:
 /etc/oam/aif0.conf
 /etc/oam/radio/manual.conf
 /etc/oam/config_database_SR_TX_Div.db3
 /etc/oam/band.conf
 /etc/oam/log.conf
 /etc/oam/network.conf
 /var/net-snmp/data/RRH
 /var/net-snmp/data/nodeName
 /var/net-snmp/data/swmParams
 /var/net-snmp/data/rrhaw2sTxSigPathEutraTable
 /var/net-snmp/data/rrhaw2sRxSigPathEutraTable
 /etc/oam/ori.conf
 /lib/firmware/fdd/dsp-core0.out
 /lib/firmware/fdd/dsp-core1.out
 /lib/firmware/fdd/dsp-core2.out
 /lib/firmware/fdd/dsp-core3.out
[DONE]
Sync filesystem                                 [DONE]
root@AZB_NC0M_4300:~#
```

Figure 9: Making changes persistent

Step 6: Use the command "***restart/reboot***" to reboot the system. See illustration below.

```
root@AZB_NC0M_4300:~# restart
AZCOM-LTE-OAM-BBU-MIB::eNodeBopStatus.0 = INTEGER: restart(10)
root@AZB_NC0M_4300:~#
Broadcast message from root@AZB_NC0M_4300 (Sun Jan 25 16:22:43 1970):

INIT: Sending pStopping OpenBSD Secure Shell server: sshdstopped /usr/sbin/sshd (pid 2817)
.
cppi library link established for device : k2hk
hyplnk library link established for device : k2hk
qmss library link established for device : k2hk
Stopping mpmsrv daemon.
Stopping tiipclad daemon.
Stopping quagga watchdog daemon: watchquagga.
stopping Busybox UDHCP Server: udhcpd... stopped udhcpd (pid 3034)
done.
Stopping system message bus: dbus.
Stopping ntpd: done
stopping SFP Leds/FPGA Flash mux selector: sfpfix... done.
Stopping network management services:stopped /usr/sbin/snmpd (pid 3027)
 snmpdno /usr/sbin/snmptrapd found; none killed
 snmptrapd.
Stopping syslogd/klogd: stopped syslogd (pid 2887)
stopped klogd (pid 2890)
```

Figure 10: Restarting eNodeB

3. Procedure to Replace Layer3 Executable

Use the following procedure to replace Azcom LTE eNodeB protocol stack Layer 3 executable.

Step 1: Copy the eNB.bin in ***/usr/bin/*** folder. See Figure 11 & 12 below.

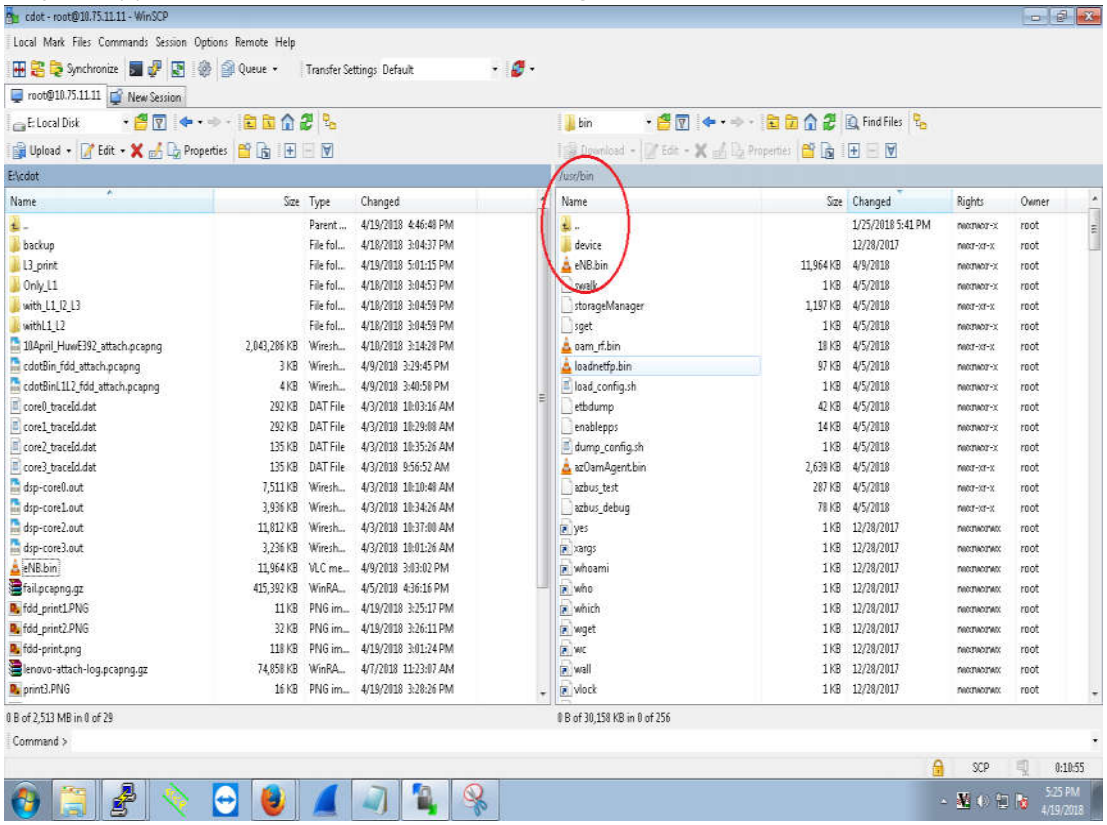

Figure 21: Transferring of Layer3 executable

```
-rwxrwxr-x    1 root     root           377 Apr  5  2018 load_config.sh
-rwxrwxr-x    1 root     root         43000 Apr  5  2018 etbdump
-rwxrwxr-x    1 root     root         13348 Apr  5  2018 enablepps
-rwxrwxr-x    1 root     root           272 Apr  5  2018 dump_config.sh
-rwxr-xr-x    1 root     root        292978 Apr  5  2018 azbus_test
-rwxr-xr-x    1 root     root         78989 Apr  5  2018 azbus_debug
-rwxr-xr-x    1 root     root       2701416 Apr  5  2018 azOamAgent.bin
-rwxrwxr-x    1 root     root      12250140 Apr  9  2018 eNB.bin
root@AZB_NCOM_4300:/usr/bin#
```

Figure 32: Listing of directory

Step 2: Use an editor, to add the absolute path of executable in the following file:

/mnt/csc/packages/actual/0.package.cfgfiles

See illustration below.

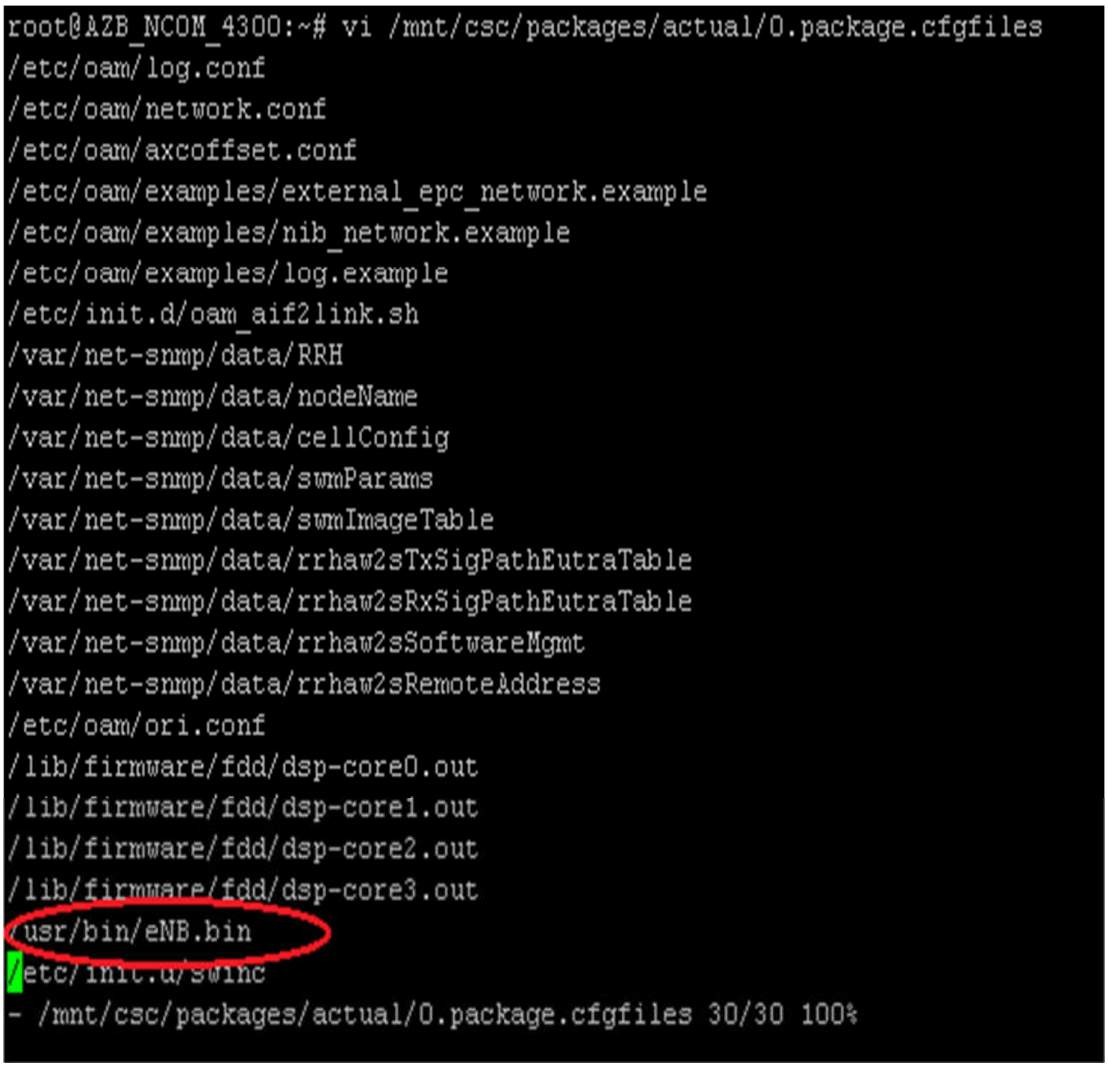

Figure 43: Adding absolute path of the executable

Step 3: Use an editor to update the file "***/etc/init.d/swinc***" and comment the following lines:

```
#       while true; do
#               sleep 1
#       done
```

See illustration below.

```
root@AZB_NCOM_4300:~# vi /etc/init.d/swinc

do_log()
{
        status=$1
        message=$2
        error_string=$3

        if [ $status -eq 0 ]; then
                echo "[PASSED]"
                echo "$DATE $message Software Integrity PASSED"
        else
                echo "[FAILED]"
                echo "$DATE $message Software Integrity FAILED"
        #       while true; do
        #               sleep 1
        #       done
        fi
}

case "$1" in
    start)
        # Crete log file if not exists
I /etc/init.d/swinc [Modified] 65/97 67%
```

Figure 54: Editing swinc file

Step 4: Use an editor, to add the absolute path of the updated ***swinc*** file in the following file:

/mnt/csc/packages/actual/0.package.cfgfiles

See illustration below.

```
root@AZB_NCOM_4300:~# vi /mnt/csc/packages/actual/0.package.cfgfiles
/etc/oam/log.conf
/etc/oam/network.conf
/etc/oam/axcoffset.conf
/etc/oam/examples/external_epc_network.example
/etc/oam/examples/nib_network.example
/etc/oam/examples/log.example
/etc/init.d/oam_aif2link.sh
/var/net-snmp/data/RRH
/var/net-snmp/data/nodeName
/var/net-snmp/data/cellConfig
/var/net-snmp/data/swmParams
/var/net-snmp/data/swmImageTable
/var/net-snmp/data/rrhaw2sTxSigPathEutraTable
/var/net-snmp/data/rrhaw2sRxSigPathEutraTable
/var/net-snmp/data/rrhaw2sSoftwareMgmt
/var/net-snmp/data/rrhaw2sRemoteAddress
/etc/oam/ori.conf
/lib/firmware/fdd/dsp-core0.out
/lib/firmware/fdd/dsp-core1.out
/lib/firmware/fdd/dsp-core2.out
/lib/firmware/fdd/dsp-core3.out
/usr/bin/eNB.bin
/etc/init.d/swinc
- /mnt/csc/packages/actual/0.package.cfgfiles 30/30 100%
```

Figure 15: Adding absolute path for swinc

Step 5: Use the command "***configuration save all***" to make the changes persistent. See illustration below.

```
root@AZB_NCOM_4300:~# configuration save all
Wait for other configuration commands           [DONE]
Create working directory                        [DONE]
Add Platform configuration files:
 /etc/network/interfaces
 /etc/oam/rf.conf
 /var/net-snmp/snmpd.conf
 /usr/share/snmp/snmpd.conf
[DONE]
Add Layer 0 configuration files:
 /etc/oam/aif0.conf
 /etc/oam/radio/manual.conf
 /etc/oam/config_database_SR_TX_Div.db3
 /etc/oam/band.conf
 /etc/oam/log.conf
 /etc/oam/network.conf
 /var/net-snmp/data/RRH
 /var/net-snmp/data/nodeName
 /var/net-snmp/data/swmParams
 /var/net-snmp/data/rrhaw2sTxSigPathEutraTable
 /var/net-snmp/data/rrhaw2sRxSigPathEutraTable
 /etc/oam/eri.conf
 /usr/bin/eNB.bin
 /etc/init.d/swinc
[DONE]
Sync filesystem                                 [DONE]
root@AZB_NCOM_4300:~#
```

Figure 16: Making configuration persistent

Step 6: Use the command "***restart/reboot***" to reboot the system. See illustration below.

```
root@AZB_NCOM_4300:~# restart
AZCOM-LTE-OAM-BBU-MIB::eNodeBopStatus.0 = INTEGER: restart(10)
root@AZB_NCOM_4300:~#
Broadcast message from root@AZB_NCOM_4300 (Sun Jan 25 16:22:43 1970):

INIT: Sending pStopping OpenBSD Secure Shell server: sshdstopped /usr/sbin/sshd (pid 2817)
.
cppi library link established for device : k2hk
hyplnk library link established for device : k2hk
qmss library link established for device : k2hk
Stopping mpmsrv daemon.
Stopping tiipclad daemon.
Stopping quagga watchdog daemon: watchquagga.
stopping Busybox UDHCP Server: udhcpd... stopped udhcpd (pid 3034)
done.
Stopping system message bus: dbus.
Stopping ntpd: done
stopping SFP Leds/FPGA Flash mux selector: sfpfix... done.
Stopping network management services:stopped /usr/sbin/snmpd (pid 3027)
 snmpdno /usr/sbin/snmptrapd found; none killed
 snmptrapd.
Stopping syslogd/klogd: stopped syslogd (pid 2887)
stopped klogd (pid 2890)
```

Figure 17: Restarting eNodeB