Software Upgrade,
BootROM and MiniBoot update procedures
for OmniSwitch 6600, 7000 & 8800 series

In this document

Introduction

This document is meant to guide engineers through the process of upgrading software and especially updating the *BootROM* on the OmniSwitch 6600, 7000 & 8800 series. Note that if the switch ends up with a corrupted *BootROM*, the OmniSwitch will not be able to boot. To recover, it is necessary to send it back to Alcatel for repair.

The basic primary functionalities of the *BootROM* and *MiniBoot* are to support the SDRAM, DIMM & Flash SIMM modules and initialize the following items:
- The file system,
- The 16550 UART driver,
- System Memory tests,
- And other kernel features.

The *BootROM* and *MiniBoot* require 2MB of free flash space to implement the boot sectors. This space will be used to hold one compressed copy of the *BootROM* and two compressed copies of the *MiniBoot* (Default & Backup)

The *BootROM* is responsible for configuring the CMM hardware so that the *VxWorks* © operating system can be booted.

The *MiniBoot* is a simplified version of the *VxWorks* © operating system.
This provides a limited interface to your switch for basic configuration. These commands provide more functionality than the simpler BootROM and they can be used when the Command Line Interface (CLI), Simple Network Management Protocol (SNMP), or WebView interfaces are unavailable. MiniBoot commands will allow users to load new files.

Note: Using *MiniBoot* commands incorrectly or improperly can damage your switch. Therefore, do not attempt to use these commands unless you have been directed by Alcatel Technical Support to do so.

Software Version / Code Upgrade

Here you can find a complete Software Upgrade procedure based on a 6648. Note that the Software upgrade procedure is similar for the 6600, 7000 & 8800 series. However there are some differences due to the hardware itself. For instance, for the 7000 & 8800 series you can either use the CMM EMP port or any ENI port to FTP software files, but on the 6600 series there is no EMP port.

This example is based on a 6648 upgrading from 5.1.2.28R01 to 5.1.4.182.R01 (BootROM 5.1.2.2.R01 to 5.1.4.128.R01).

*** Power on the system and check the hardware info and the version that is loaded in the working directory.*

```
-> show hardware info
CPU Type                          : PowerPC 8245,
Flash Manufacturer                : SanDisk SDCFB-32,
Flash size                        : 32505856 bytes (31 MB),
RAM Manufacturer                  : Kingston,
RAM size                          : 134217728 bytes (128 MB),
NVRAM Battery OK                  : YES,
Interrupt Boot Jumper            : OFF,
Force UART Defaults Jumper       : OFF,
Run Extended Memory Diags Jumper  : OFF,
Spare Jumper                      : ON,
BootROM Version                   : 5.1.2.2.R01,
Backup MiniBoot Version           : 5.1.2.2.R01,
Default MiniBoot Version          : 5.1.2.2.R01,

-> show microcode working
Package          Release                Size      DescrIPtion
-----------------+---------------------+--------+----------------------------
Hbase.img        5.1.2.28.R02           2764984 Base Software
Hdiag.img        5.1.2.31.R02            111095 Diagnostics Archive
Heni.img         5.1.2.28.R02           1161565 Ethernet Network Interface So
Hl2eth.img       5.1.2.28.R02            686133 Layer 2, Ethernet
Hos.img          5.1.2.28.R02            850361 Operating System
Hqos.img         5.1.2.28.R02            220118 Quality of Service
Hrout.img        5.1.2.28.R02            279453 Routing
Hweb.img         5.1.2.28.R02           1055327 Webview - Main
Hwebl2eth.img    5.1.2.28.R02            184685 Webview - Layer 2 and Etherne
Hwebqos.img      5.1.2.28.R02            133221 Webview - Quality of Service
Hwebrout.img     5.1.2.28.R02            123542 Webview - Routing
```

*** Give VLAN 1 an IP address that can be reached from the network. (On the 7000 and 8800 series you can use the EMP port)*

```
-> VLAN 1 router IP 10.255.13.26 255.255.255.0
```

*** Enable FTP on the switch.*

```
-> aaa authentication FTP local
```

*** Delete all .img files from the /flash/working directory.*

```
-> rm working/*.img
```

*** Now FTP the image files to the* `/flash/working` *** directory.*

```
THU AUG 07 15:23:53 : FTP (82) info message:
+++ Session 1 New Connection, Client Address 10.255.13.250

THU AUG 07 15:25:10 : FTP (82) info message:
+++ Session 1, Session Deleted
```

-> ls

```
Listing Directory /flash:

-rw        258 Aug  7 15:15 boot.params
drw        512 Jun 19 13:35 certified/
drw        512 Aug  7 15:24 working/
-rw         12 Mar 14 12:31 boot.slot.cfg
-rw      64000 Aug  7 15:25 swlog1.log
-rw      64000 Mar 14 12:33 swlog2.log
drw        512 Mar 14 12:31 network/
-rw     568445 Aug 14 06:16 miniboot.backup
-rw     259844 Aug  7 15:25 bootrom.bin
-rw     568445 Aug 14 06:16 miniboot.default


      11979264 bytes free
```

*** Run the install command*

-> install /flash/working/*.img
```
Installation of Hadvrout.img was successful.
Installation of Hbase.img was successful.
Installation of Hdiag.img was successful.
Installation of Heni.img was successful.
Installation of Hl2eth.img was successful.
Installation of Hos.img was successful.
Installation of Hqos.img was successful.
Installation of Hrout.img was successful.
Installation of Hsecu.img was successful.
Installation of Hweb.img was successful.
Installation of Hwebadvrout.img was successful.
Installation of Hwebl2eth.img was successful.
Installation of Hwebqos.img was successful.
Installation of Hwebrout.img was successful.

Installing Hwebsecu.img. Continue ?(<CR> = Yes) y
Installation of Hwebsecu.img was successful.
```

*** Save your work so far.*

-> write memory

```
File /flash/working/boot.cfg replaced.
This file may be overwritten if "takeover" is executed before "certify"
```

*** You need to reload your switch in order to take into account the new version of code*

-> reload working no rollback-timeout
```
Confirm Activate (Y/N) : Y
```

*** When the boot up process is completed and everything runs fine,*
*** Copy the new image files and configuration to the certified directory*

```
-> copy working certified

THU AUG 07 15:26:39 : CSM-CHASSIS (103) info message:
+++ == CSM == CERTIFYing software process started
+++ == CSM == Setting CERTIFY Timeout for 156 seconds
Copying Hadvrout.img              .....................      completed
Copying Hbase.img                 .....................      completed
Copying Hdiag.img                 .....................      completed
Copying Heni.img                  .....................      completed
Copying Hl2eth.img                .....................      completed
Copying Hos.img                   .....................      completed
Copying Hqos.img                  .....................      completed
Copying Hrelease.img              .....................      completed
Copying Hrout.img                 .....................      completed
Copying Hsecu.img                 .....................      completed
Copying Hweb.img                  .....................      completed
Copying Hwebadvrout.img           .....................      completed
Copying Hwebl2eth.img             .....................      completed
Copying Hwebqos.img               .....................      completed
Copying Hwebrout.img              .....................      completed
Copying Hwebsecu.img              .....................      completed
Copying boot.cfg                  .....................      completed

THU AUG 07 15:27:26 : CCM-CHASSIS (100) info message:
+++ === CS === CERTIFY completed successfully

THU AUG 07 15:27:26 : CSM-CHASSIS (103) info message:
+++ == CSM == CERTIFY process completed successfully
+++ == CSM == P15 - CERTIFIED OK. Resetting Activating 2 Flags
```

*** You may also want to synchronize your CMMs in case of CMM redundancy in order to get*
*** "Continuous Smart Switching", please read chapter "**Loading Software**" from the **Getting***
*** **Started Guide** to get further details.*

BootROM and MiniBoot Update

This procedure is for standalone 6600 and non-redundant 7000 or 8800 configuration. **Do not use this procedure with switches in stacked configurations or redundant configuration.**
In case this procedure is not suitable for you, or if you have any doubts or questions regarding this process, please contact Alcatel eND's Customer Support:

> **Internet:** http://eservice.ind.alcatel.com/ (EMEAI Business Partners: http://www.businesspartner.alcatel.com/).
> **Email:** mailto:support@ind.alcatel.com (EMEAI Business Partners: mailto:support.center@alcatel.fr)

> North America **800-995-2696**   Asia Pacific **+65-394-7933**
> Latin America **877-919-9526**   Other International **+1-818-878-4507**
> Europe (EMEAI) **+33-388-55-69-04**

** When your 5.1.4 Software upgrade is completed, if you need to upgrade the BootROM and/or
** MiniBoot, then FTP the bootrom.bin, and/or the miniboot.default, miniboot.backup files to the
** /flash directory.

```
-> dshell
Certified: [Kernel]->bootChange
'.' = clear field;  '-' = go to previous field;  ^D = quit

boot device                             : flash
processor number                        : 0
host name                               : OmniSwitchCmm
file name                               :
inet on ethernet (e)                    : 192.168.1.1:ffffff00
inet on backplane (b)                   :
host inet (h)                           : 192.168.10.1
gateway inet (g)                        : 192.168.1.254
user (u)                                : OmniSwitchUser
FTP password (pw) (blank = use rsh)     : OmniSwitchPassword
flags (f)                               : 0x0 0x1000    ** to stop in MiniBoot
target name (tn)                        : OmniSwitch
startup scrIPt (s)                      :
other (o)                               : lnPci
serial (console) baud (cb)              : 9600
serial (console) parity (cp)            : none
serial (console) stopbits (cs)          : 1
serial (console) wordsize (cw)          : 8
serial (console) mode (cm)              : modemControlOff
memory size (ms) (64 or 128)            : 0
value = 0 = 0x0
Certified: [Kernel]->exit
```

*** Now reboot the system.*

```
-> reload
Confirm Reload (Y/N) : y

->
THU AUG 07 15:27:56 : CSM-CHASSIS (103) info message:
+++ == CSM == CSM_P11_2 - RELOAD current CMM on HAWK
+++ == CSM == !!! REBOOT !!!
mu

Copyright 1984-1998  Wind River Systems, Inc.
CPU: Alcatel CMM MPC8245/100
AOS boot-ROM version: 5.1.2.2.R01
Creation date: Nov 13 2002, 11:02:39
```

*** The following may or may not appear depending on Jumper position*

```
** Interrupt the boot sequence by pressing "y" twice.
Press any key to stop auto-boot...
 7
boot device                          : flash
unit number                          : 0
processor number                     : 0
host name                            : OmniSwitchCmm
inet on ethernet (e)                 : 192.168.1.1:ffffff00
host inet (h)                        : 192.168.10.1
gateway inet (g)                     : 192.168.1.254
user (u)                             : OmniSwitchUser
FTP password (pw)                    : OmniSwitchPassword
flags (f)                            : 0x1000
target name (tn)                     : OmniSwitch
other (o)                            : lnPci
serial (console) baud (cb)           : 9600
serial (console) parity (cp)         : none
serial (console) stopbits (cs)       : 1
serial (console) wordsize (cw)       : 8
serial (console) mode (cm)           : modemControlOff
memory size (ms) (64 or 128)         : 0


-----------------------
Hardware jumper settings
-----------------------
Interrupt Boot                       : disabled
Force UART (serial port) Defaults    : disabled
Run Extended Memory Test             : disabled
Spare Jumper                         : enabled

Starting at 0x500000...

startType=0x82 (COLD) (w/ POWER ON RESET)
 The current date and time is:
Coordinated Universal Time (UTC): THU AUG 07 15:28:46 2003
Local time: THU AUG 07 15:28:46 2003 UTC

/flash/  - disk check in progress ...
/flash/  - Volume is OK

        total # of clusters:    58,075
         # of free clusters:    19,278
          # of bad clusters:    0
            total free space:   12,338     max contiguous free space:  3,066,880
bytes
                # of files:     58
              # of folders:     5
        total bytes in files:   12,338     # of lost chains:    0
```

```
    total bytes in lost chains:  12,338Boot parameters are:

 'flash(0,0)OmniSwitchCmm: e=192.168.1.1:ffffff00 h=192.168.10.1 g=192.168.1.254
u=OmniSwitchUser pw=OmniSwitchPassword f=0x1000 tn=OmniSwitch o=lnPci cb=9600 cp=none
cs=1 cw=8 cm=modemControlOff'


Adding 4456 symbols for standalone.
Spare jumper grounded: not enabling WDB

AOS MiniBoot version: 5.1.2.2.R01
WARNING: Stopping in MiniBoot as directed by boot flags...
WARNING: Network is not active.
Enter "alaHelp" for help on administrative commands.
```

*** Do NOT reboot until you get the "Bootrom updated!!!" message.**
*** The following is a failed attempt to write the new ROM. see below.**
*** Please ensure the bootrom.bin file is in the /flash directory**

```
[MiniBoot]->sysUpdateBootrom
Erasing bootrom...
Error erasing bootrom.
Delaying 5 seconds before retry...
*** WARNING: Retry no. 1.
Erasing bootrom...
Error erasing bootrom.
Delaying 5 seconds before retry...
*** WARNING: Retry no. 2.
{ootrom NOT updated!!!
value = -1 = 0xffffffff = udbinfo + 0xff93033f
```

*** The following is a good write sequence - it is safe to reboot at the end.**

```
[MiniBoot]->sysUpdateBootrom
Erasing bootrom...
Programming bootrom with '/flash/bootrom.bin'...
Bootrom updated!!!
value = 0 = 0x0
```

*** The following procedure is to be followed if the Miniboot Default and Backup upgrade is necessary;**
*** Please ensure the miniboot.default, and miniboot.backup files are in the /flash directory**

```
[Miniboot]->sysUpdateMiniboot (0)
Allocating temporary buffer for checksuming miniboot image...
Reading miniboot image into temporary buffer...
Checksuming miniboot image...
Checksum OK. Proceeding with update...
Default start sector = e580, backup start sector = ec80

 /flash/miniboot.default update successful
 Default miniboot updated!!!
value = 0 = 0x0
```

```
[Miniboot]->sysUpdateMiniboot (1)
Allocating temporary buffer for checksuming miniboot image...
Reading miniboot image into temporary buffer...
Checksuming miniboot image...
Checksum OK. Proceeding with update...
Default start sector = e580, backup start sector = ec80

 /flash/miniboot.backup update successful
 Backup miniboot updated!!!
value = 0 = 0x0
```

*** Use the bootChange to cycle through the boot parameters and change the flag.*

```
[MiniBoot]->bootChange
'.' = clear field;  '-' = go to previous field;  ^D = quit
boot device                        : flash
processor number                   : 0
host name                          : OmniSwitchCmm
file name                          :
inet on ethernet (e)               : 192.168.1.1:ffffff00
inet on backplane (b)              :
host inet (h)                      : 192.168.10.1
gateway inet (g)                   : 192.168.1.254
user (u)                           : OmniSwitchUser
FTP password (pw) (blank = use rsh) : OmniSwitchPassword
flags (f)                          : 0x1000 0x0 ** Forces switch to boot OS.
target name (tn)                   : OmniSwitch
startup scrIPt (s)                 :
other (o)                          : lnPci
serial (console) baud (cb)         : 9600
serial (console) parity (cp)       : none
serial (console) stopbits (cs)     : 1
serial (console) wordsize (cw)     : 8
serial (console) mode (cm)         : modemControlOff
memory size (ms) (64 or 128)       : 0
value = 0 = 0x0
```

*** Reboot switch*

```
[MiniBoot]->sysBoardReset
value = 8muxLoad failed!
usrRoot(): COLD Boot.

usrRoot(): Booting MiniBoot from flash boot sectors...
Starting at 0x500000...

startType=0x82 (COLD) (w/ POWER ON RESET)
 The current date and time is:
Coordinated Universal Time (UTC): THU AUG 07 15:30:47 2003
Local time: THU AUG 07 15:30:47 2003 UTC

/flash/  - disk check in progress ...
/flash/  - Volume is OK

        total # of clusters:    58,075
         # of free clusters:    19,278
          # of bad clusters:    0
            total free space:   12,338    max contiguous free space:  3,066,880
bytes
                # of files:     58
              # of folders:     5
        total bytes in files:   12,338     # of lost chains:     0
   total bytes in lost chains:  12,338Boot parameters are:

 'flash(0,0)OmniSwitchCmm: e=192.168.1.1:ffffff00 h=192.168.10.1 g=192.168.1.254
u=OmniSwitchUser pw=OmniSwitchPassword tn=OmniSwitch o=lnPci cb=9600 cp=none cs=1 cw=8
cm=modemControlOff'


Adding 4456 symbols for standalone.
Spare jumper grounded: not enabling WDB


AOS MiniBoot version: 5.1.2.2.R01
Attempting to load from the CERTIFIED directory...
Loading kernel from '/flash/certified/Hos.img'...
```

```
2622332
Loaded 'alcatelNetworking_kernel.lnk' from '/flash/certified/Hos.img'.
Starting at 0x100000...

startType=0x82 (COLD) (w/ POWER ON RESET)
 The current date and time is:
Coordinated Universal Time (UTC): THU AUG 07 15:30:55 2003
Local time: THU AUG 07 15:30:55 2003 UTC


/flash/  - Volume is OK
Boot parameters are:

 'flash(0,0)OmniSwitchCmm: e=192.168.1.1:ffffff00 h=192.168.10.1 g=192.168.1.254
u=OmniSwitchUser pw=OmniSwitchPassword tn=OmniSwitch o=lnPci cb=9600 cp=none cs=1 cw=8
cm=modemControlOff'

Attaching network interface lo0... done.

Adding 5063 symbols for standalone.
Spare jumper grounded: not enabling WDB

AOS kernel version: 5.1.4.182.R01
VxWorks (for Alcatel CMM MPC8245/100) version 5.4
KERNEL: WIND version 2.5
Made on Aug  6 2003, 05:06:07.
Copyright Wind River Systems, Inc., 1984-2000

CPU: Alcatel CMM MPC8245/100.  Processor #0.
Memory Size: 0x7a00000 (122 MB).  BSP version 1.2/25.
The OmniSwitch uses licensed RSA Security technology for
SSL (BASE SSL-C) and authentication (ACE/Agent for SecurID).

WDB: Agent configuration failed.Starting dynamic software load from
'/flash/certified/'...
IPc_ping - Binding of socket successfull snapid =  1

THU AUG 07 15:31:18 : SYSTEM (75) info message:
+++ Switch Logging device '/dev/console' enabled for output
      0 MSG, fcn ASIC_GetVersion, tid  6c7c4d0:
Current ASIC is IXE2424 B1

THU AUG 07 15:31:18 : CSM-CHASSIS (103) info message:
+++ == CSM == === Chassis Supervision Starting Up ===
      1 MSG, fcn ASIC_GetVersion, tid  6c7c4d0:
Current ASIC is IXE2424 B1

niDrv: Reset of Module 1 OK
IPc_connect_mon[498] IPC elements 80
IPc_connect_mon[529] IPC returned elements 80
sysStartWatchdog() Starting watchdog timer to RESET after 60 secs.

THU AUG 07 15:31:51 : CSM-CHASSIS (103) info message:
+++ == CSM == MONITORING ON
+++ == CSM == ===== THIS STACK IS PRIMARY =====

THU AUG 07 15:31:54 : PRB-CHASSIS (102) info message:
+++ Module 2 Detected!
+++ csPrbMain: Hawk 48 extension board present! Notify HSM

THU AUG 07 15:31:55 : HSM-CHASSIS (101) info message:
+++ == HSM == Power Supply 15 is OPERATIONAL

THU AUG 07 15:32:02 : SSH (109) alarm message:
+++ SSH daemon waiting for DSA Key to be generated ...

THU AUG 07 15:32:28 : WEB (69) alarm message:
+++ WebView SSL/RSA file-based certificate set-up successful!

THU AUG 07 15:32:32 : SSH (109) alarm message:
```

```
+++ SSH daemon waiting for DSA Key to be generated ...

THU AUG 07 15:32:35 : CSM-CHASSIS (103) info message:
+++ == CSM == CMM startup completed

THU AUG 07 15:32:42 : SSH (109) alarm message:
+++ Generating ssh public/private dsa key pair.

THU AUG 07 15:32:52 : SSH (109) alarm message:
+++ SSH daemon waiting for DSA Key to be generated ...

THU AUG 07 15:33:04 : SSH (109) alarm message:
+++ DSA parameters generated

THU AUG 07 15:33:05 : SSH (109) alarm message:
+++ Your identification has been saved in /flash/network/ssh_host_dsa_key.
+++ Generation of DSA key for ssh done

login : admin
password : *******
Welcome to the Alcatel OmniSwitch 6000
Software Version 5.1.4.182.R01 Service Release, August 06, 2003.
Copyright(c), 1994-2003 Alcatel Internetworking, Inc. All Rights reserved.

OmniSwitch(TM) is a trademark of Alcatel Internetworking, Inc. registered
in the United States Patent and Trademark Office.
```

*** *The rest is self-explanatory and should be used to ensure everything is okay.*

```
-> show hardware info
CPU Type                          : PowerPC 8245,
Flash Manufacturer                : SanDisk SDCFB-32                        ,
Flash size                        : 32505856 bytes (31 MB),
RAM Manufacturer                  : Kingston,
RAM size                          : 134217728 bytes (128 MB),
NVRAM Battery OK                  : YES,
Interrupt Boot Jumper             : OFF,
Force UART Defaults Jumper        : OFF,
Run Extended Memory Diags Jumper  : OFF,
Spare Jumper                      : ON,
BootROM Version                   : 5.1.4.128.R01,
Backup MiniBoot Version           : 5.1.2.2.R01,
Default MiniBoot Version          : 5.1.2.2.R01,
```

After the upgrade remove the bootrom.bin, miniboot.default and miniboot.backup files from the /flash directory:

```
-> ls

Listing Directory /flash:

-rw        258 Aug  7 15:15 boot.params
drw        512 Jun 19 13:35 certified/
drw        512 Aug  7 15:24 working/
-rw         12 Mar 14 12:31 boot.slot.cfg
-rw      64000 Aug  7 15:25 swlog1.log
-rw      64000 Mar 14 12:33 swlog2.log
drw        512 Mar 14 12:31 network/
-rw     568445 Aug 14 06:16 miniboot.backup
-rw     259844 Aug  7 15:25 bootrom.bin
-rw     568445 Aug 14 06:16 miniboot.default


       11979264 bytes free

-> rm bootrom.bin
-> rm miniboot.backup
-> rm miniboot.default
```