

Upgrading to Release 3.1.00

This appendix describes how to upgrade the SBC image to v3.1.0. Release 3.1.0 is not backwards compatible with Release 3.0.2 because some configuration and functionality has changed and thus, in-service upgrade from 3.0.x to 3.1.00 is not feasible.

Migration to release 3.1.0 requires a brief service downtime. Also, for a brief period of time during the upgrade, the system is not be protected by a backup. Because ISSU is not supported, at one stage during migration the existing sessions on the active blade will be lost.

The procedure described here is markedly different from the standard upgrade process for earlier versions of SBC. Some individual steps may be identical.

This appendix defines the scope, approach, resources, schedule, risks and mitigations, and entry and exit criteria that are required as part of upgrade planning. If the upgrade fails, this document describes steps to fall back to the previous version and abort gracefully.

The output shown in this document reflects the output captured on the system where this process was done. The configuration, location of the SBC in specific slots, VLAN configuration, supervisor card configuration, supervisor image version of the actual system being upgraded will most likely not match the description here. Also, it is assumed that the system is configured to boot the SBC from the local flash on the ACE card. Thus, on an actual system the steps may be different

Definitions

As referenced in this document the states Active and Standby can be determined on the SBC by executing the following command:

```
card_A/Admin# show ft group brief
```

The output on an active blade is of the form:

```
FT Group ID: 1  My State:FSM_FT_STATE_ACTIVE      Peer State:FSM_FT_STATE_STANDBY_HOT
                Context Name: Admin              Context Id: 0

FT Group ID: 2  My State:FSM_FT_STATE_ACTIVE      Peer State:FSM_FT_STATE_STANDBY_HOT
                Context Name: vlan100            Context Id: 1
```

Because all the FT groups have "My State" as FSM_FT_STATE_ACTIVE, the blade is in the Active state.

The output on the standby blade is of the form:

```
FT Group ID: 1  My State:FSM_FT_STATE_STANDBY_HOT      Peer State:FSM_FT_STATE_
ACTIVE
                Context Name: Admin              Context Id: 0
```

```
FT Group ID: 2 My State:FSM_FT_STATE_STANDBY_HOT Peer State:FSM_FT_STATE_
ACTIVE
```

```
Context Name: vlan100 Context Id: 1
```

Because all the FT groups have "My State" as FSM_FT_STATE_STANDBY_HOT, the blade is in Standby state.

When the second SBC comes up, it goes through various state transitions before going to FSM_FT_STATE_STANDBY_HOT. Until that time, do not execute the **ft switchover** command on the Active blade.

If there are active calls/subscribers on the active SBC, synchronizing them to the standby SBC can take some time (proportional to the number of sessions or subscribers).

**Note**

Before the upgrade, save Release 3.0.2 based configurations to disk0 (as sbc3.0.2.cfg), then remove billing configuration on the active and execute a **write memory all** command on both active and standby blades. If the upgrade fails, copy the disk0:3.0.2.cfg to running configuration to retrieve the original configuration and save it again with the **write memory all** command.

**Note**

During upgrade, until the Blade A is Active and Blade B is Standby at version 3.1.00, do not do a **write memory** command on either of the blades. The **write memory** command will save the new configuration, which is not backwards compatible, with version 3.0.2. Thus, in case the upgrade fails, the configuration, if saved, will not work with the version 3.0.2 image.

**Note**

The procedure describes the commands as executed on the sample system. Your configuration may vary and thus, the exact sequence of steps may vary.

Assumptions

This upgrade procedure makes the following assumptions:

- The SBC is in slots 3 and 4, referred to as slot3 and slot4. The SBC in slot3 is Active and the SBC in slot4 is Standby.
- Both the slots are at version 3.0.2 and are being upgraded to 3.1.0.
- The SBC is configured to boot from the internal flash and thus the image needs to be copied to the SBC. During the upgrade process, the SBC is booted from the image located on disk0 of the Supervisor card.

High Level Steps

This section provides a high level overview of the upgrade process. It also lists the steps to fall back to the existing 3.0.2 version if the upgrade of either slot3 or slot4 fails. The steps are a summary of the detailed steps and do not exactly match the detailed steps.

1. Backup the current configuration on both cards.

2. Remove the billing configuration and save the configuration on both slot3 and slot4 as startup-config (**write memory all** command).
3. Copy the 3.1.0 image to disk0: of the supervisor and then to the internal flash of both slot3 and slot4.
4. Remove slot4 from svcld on SUP.
 - a. Card slot3 is functional as Active without a backup.
5. Change boot string for slot4 to 3.1.0 and reset from SUP (boot slot4).
 - a. Wait for slot4 to boot to Active state, when successful. go to step 6.
 - b. On failure to boot to Active, change boot string to 3.0.2 and reset slot4.
 - c. Add slot4 to svcld before it has booted up.
 - d. Slot4 should come up as Standby with 3.0.2.
 - e. Reconfigure billing if it was unconfigured.
 - f. When state is synchronized (to STANDBY_HOT), execute the **write memory all** command.
 - g. Upgrade failed, abort (collect relevant data).
6. Add new billing configuration to slot4.
7. Remove slot3 from svcld on SUP.
 - a. Active calls on slot3 will be dropped, leading to total outage while (b) is done
 - b. Add slot4 to svcld on SUP.
 - c. Slot4 will start acting as Active with no backup.
8. Change boot string for slot3 to 3.1.0 and reset from SUP (boot slot3).
9. Add slot3 to svcld immediately after the reset above.
10. If slot3 successfully comes up as standby, do a **ft switchover** command when in steady state and reboot slot4 as Standby:
 - a. Save running configuration as startup config.
 - b. The upgrade is complete at this stage.
11. If slot3 fails to come up as active:
 - a. Remove slot3 from svcld.
 - b. Copy saved 3.0.2 configuration to startup configuration (to get original billing configuration).
 - c. Change boot string to 3.0.2 and reset slot3.
 - d. Wait for slot3 to come up as Active.
 - e. Remove slot4 from svcld. This leads to total outage until (f) below is done.
 - f. Add slot3 to svcld.
 - g. Change boot string for slot4 to 3.0.2 and reset slot4.
 - h. Immediately add slot4 to svcld.
 - i. Slot3 is active and slot4 will be standby when it comes up.
 - j. Collect relevant data. Upgrade failed.

Pre-Upgrade Procedure

In this procedure, we are upgrading from image 3.0.2 to image 3.1.0. Here we assume that the ACE card slot3 inserted in slot 3 is Active and ACE card slot4 inserted in slot 4 is Standby. The actual location of Active and Standby cards in your configuration will vary.

The pre-upgrade process collects various data from the running system. The output shown here is sample output. You should collect the corresponding data and save it to have it available for troubleshooting.



Note

In this document, sample output is only shown for certain commands. You should collect output for all the commands shown here.

1. Ensure that the server holding the 3.1.00 image is accessible from the supervisor module (ping from supervisor to confirm):

```
Sup# ping bizarre

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 64.102.16.25, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/4 ms
Sup#
```

2. Verify the md5sum of the image on the tftp server:



Note On some UNIX/LINUX servers, this should be cksum.

```
bizarre# md5sum c76-sbck9-mzg.3.0.1_AS31_0.bin
```

This should match the md5sum as documented on the Cisco Connections Online (CCO) site from which the image was obtained.

3. Copy the image to the disk0 of the supervisor. On supervisor, execute the following:

```
sup# copy tftp://bizarre/test/ c76-sbck9-mzg.3.0.1_AS31_0.bin disk0:
```

4. Verify the checksum after upload to the supervisor by executing the following command (The output of this should match the output from step 2 above):

```
sup# verify /md5 disk0:c76-sbck9-mzg.3.0.1_AS31_0.bin
```

5. Copy the image to both active and standby cards:

```
sup# copy disk0:c76-sbck9-mzg.3.0.1_AS31_0.bin tftp://127.0.0.30/mnt/cf/
sup# copy disk0:c76-sbck9-mzg.3.0.1_AS31_0.bin tftp://127.0.0.40/mnt/cf/
```

6. Execute the following commands on the supervisor and capture the output of the same (a partial sample output is shown here):

- a. Execute the show version command:

```
sup# show version
Cisco IOS Software, c7600s72033_rp Software (c7600s72033_rp-IPSERVICES-M), Version
12.2(33)SRC1, RELEASE SOFTWARE
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2008 by Cisco Systems, Inc.
Compiled Fri 23-May-08 05:13 by prod_rel_team
```

```
ROM: System Bootstrap, Version 12.2(17r)S4, RELEASE SOFTWARE
```

```
Sup uptime is 8 weeks, 5 days, 2 hours, 31 minutes
Uptime for this control processor is 8 weeks, 5 days, 2 hours, 29 minutes
System returned to ROM by reload at 11:30:26 PDT Thu Jul 3 2008 (SP by reload)
System restarted at 15:40:25 UTC Wed Feb 25 2009
System image file is "bootdisk:c7600s72033-ipservices-mz.122-33.SRC1.bin"
Last reload type: Normal Reload
```

```
cisco CISC07606-S (R7000) processor (revision 1.0) with 458720K/65536K bytes of
memory.
```

```
Processor board ID FOX1221GH0X
SR71000 CPU at 600Mhz, Implementation 0x504, Rev 1.2, 512KB L2 Cache
Last reset from s/w reset
7 Virtual Ethernet interfaces
50 Gigabit Ethernet interfaces
2 Ten Gigabit Ethernet interfaces
```

...

b. Execute the show running-config command:

```
sup# show running-config
```

```
Current configuration : 6144 bytes
!
! Last configuration change at 15:12:41 UTC Wed Apr 22 2009
! NVRAM config last updated at 14:16:37 UTC Wed Apr 15 2009
!
version 12.2
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
service counters max age 10
!
hostname Sup
!
boot-start-marker
boot device module 3 disk0:c76-sbck9-mzg.3.0.1_AS30_2.bin
boot device module 4 disk0:c76-sbck9-mzg.3.0.1_AS30_2.bin
boot-end-marker
!
vrf definition vlan100
description subnet 101.101.101.x
rd 55:1111
!
address-family ipv4
exit-address-family
!
vrf definition vlan200
description subnet 102.102.102.x
rd 56:1112
!
address-family ipv4
exit-address-family
!
enable password cisco
!
no aaa new-model
svclc multiple-vlan-interfaces
svclc module 3 vlan-group 99,100,200
svclc module 4 vlan-group 99,100,200
svclc vlan-group 99 99
svclc vlan-group 100 100
svclc vlan-group 200 200
```

...

c. Execute the **show module** command:

```
sup# show module
```

Mod	Ports	Card Type	Model	Serial No.
1	48	CEF720 48 port 10/100/1000mb Ethernet	WS-X6748-GE-TX	JAF1221BQGF
3	1	Application Control Engine Module	ACE20-MOD-K9	SAD1239008S
4	1	Application Control Engine Module	ACE20-MOD-K9	SAD121301Y9
5	2	Supervisor Engine 720 (Active)	WS-SUP720-3B	JAF1221AKFF

Mod	MAC addresses	Hw	Fw	Sw	Status
1	001f.cae7.3d94 to 001f.cae7.3dc3	3.0	12.2(18r)S1	12.2(33)SRC1	Ok
3	0022.55b3.cc60 to 0022.55b3.cc67	2.4	8.7(0.22)ACE	3.0(1)AS31(0	Ok
4	001f.9e1a.f70e to 001f.9e1a.f715	2.3	8.7(0.22)ACE	3.0(1)AS31(0	Ok
5	001e.be6e.8e34 to 001e.be6e.8e37	5.6	8.5(2)	12.2(33)SRC1	Ok

Mod	Sub-Module	Model	Serial	Hw	Status
1	Centralized Forwarding Card	WS-F6700-CFC	JAF1220CEPN	4.0	Ok
5	Policy Feature Card 3	WS-F6K-PFC3B	JAF1221AJJA	2.3	Ok
5	MSFC3 Daughterboard	WS-SUP720	JAF1221AJSB	3.1	Ok

Mod	Online Diag Status
1	Pass
3	Pass
4	Pass
5	Pass

d. Execute the **dir disk0** command:

```
sup# dir disk0 :
```

e. Execute the **show run** command to check svclic configuration on supervisor:

```
host1/Admin# show run | inc svclic
svclic multiple-vlan-interfaces
svclic module 3 vlan-group 99,100,200
svclic module 4 vlan-group 99,100,200
svclic vlan-group 99 99
svclic vlan-group 100 100
svclic vlan-group 200 200
```

7. Open a session on the active ACE module (slot3); execute the commands below and collect the output as appropriate:

```
sup# session slot 3 processor 0
```

(This opens a session into the slot, login with the ACE module username and password; default username is "admin" and default password is "admin.")

```
host1/Admin# show version
```

(This is sample output, your output will vary.)

```
Cisco Application Control Software (Session Border Controller)
TAC support: http://www.cisco.com/tac
Copyright (c) 2002-2007, Cisco Systems, Inc. All rights reserved.
The copyrights to certain works contained herein are owned by
other third parties and are used and distributed under license.
Some parts of this software are covered under the GNU Public
License. A copy of the license is available at
http://www.gnu.org/licenses/gpl.html.
```

```
Software
```

```

loader:    Version 12.2[120]
system:    Version 3.0(1)AS31(0) [build 3.0(1)AS31(0) test_07:14:20-2009/04/
27_/ws/test-rtt/sub]
system image file: [SUP] disk0:c76-sbck9-mzg.3.0.1_AS30_2.bin
installed license: no feature license is installed

```

Hardware

```

Cisco ACE (slot: 3)
cpu info:
  number of cpu(s): 2
  cpu type: SiByte
  cpu: 0, model: SiByte SB1 V0.2, speed: 700 MHz
  cpu: 1, model: SiByte SB1 V0.2, speed: 700 MHz
memory info:
  total: 953560 kB, free: 70244 kB
  shared: 0 kB, buffers: 3992 kB, cached 0 kB
cf info:
  filesystem: /dev/cf
  total: 1014624 kB, used: 381360 kB, available: 633264 kB

```

```

last boot reason: Service "sbc"
configuration register: 0x1
slot3 kernel uptime is 0 days 0 hour 34 minute(s) 11 second(s)

```

```
host1/Admin# dir image:
```

(This sample shows a partial output. Your output will vary. The image c76-sbck9-mzg.3.0.1_AS31_0.bin must be present.)

```

6085 Dec 12 20:38:56 2008 sbcworking.cfg
      Usage for image: filesystem
          390512640 bytes total used
          648462336 bytes free
          1038974976 bytes available

```

```
host1/Admin# dir core:
```

```
slot3/Admin# dir core:
```

```

      Usage for core: filesystem
          1068032 bytes total used
          202029056 bytes free
          203097088 bytes available

```

If this directory is not empty, clear it using the command:

```
slot3/Admin# clear cores
```

Continue with the following commands:

```

slot3/Admin# dir disk0:
slot3/Admin# show running-config
slot3/Admin# sh bootvar
BOOT variable = "disk0:c76-sbck9-mzg.3.0.1_AS30_2.bin "
Configuration register is 0x1

```

(Your output could vary depending on whether you are using a 3.0.0 or 3.0.1 image)

Continue with the following commands:

```

slot3/Admin# show ft group status
slot3/Admin# show ft group brief
slot3/Admin# show services sbc <name> rsrcmon
slot3/Admin# show services sbc <name> version
slot3/Admin# show services sbc <name> memstats
slot3/Admin# show services sbc <name> sbe calls
slot3/Admin# show services sbc <name> sbe call-stats currenthour

```

8. Open a session on the standby ACE (slot4) module and collect the output by executing the following commands:

```
sup# session slot 4 processor 0
slot4/Admin# show version
slot4/Admin# dir image:
slot4/Admin# dir core:
slot4/Admin# dir disk0:
slot4/Admin# show running-config
slot4/Admin# sh bootvar
slot4/Admin# show ft group status
slot4/Admin# show ft group brief
```

9. Verify that the SBC is configured to boot from the internal flash on the ACE.

```
Sup# show hw-module slot 4 boot
      Boot option for module 4 is 0
slot4/Admin# show bootvar
      BOOT variable = "disk0:c76-sbck9-mzg.3.0.1_AS30_2.bin"
      Configuration register is 0x1
```

(Your output above should indicate: disk0:c76-sbck9-mzg.3.0.1_AS30_2.bin or a 3.0.0 or 3.0.1 image.)

10. Pre-upgrade configuration changes:
 - a. Save running configuration on both active and standby as 3.0.2 config

```
slot3/Admin# copy running-config disk0:sbc_3_0_2.cfg
slot4/Admin# copy running-config disk0:sbc_3_0_2.cfg
```

- b. Unconfigure billing on active (slot3) if present:

```
slot3/Admin# conf t
slot3/Admin(config)# sbc mysbc
slot3/Admin(config-sbc)# sbe
slot3/Admin(config-sbc-sbe)# no billing remote
slot3/Admin(config-sbc-sbe)# end
```

- c. On both active and standby cards (slot3 and slot4), execute:

```
slot#/Admin$ write mem all
```

- d. Backup the configuration on both active and standby:

```
slot3/Admin# copy running-config disk0:sbc3.1_nobilling.cfg
slot4/Admin# copy running-config disk0:sbc3.1_nobilling.cfg
```

Detailed Upgrade Procedure

1. Modify slot4 boot configuration on supervisor, by executing the following command:

```
Sup(config)# boot device module 4 disk0: c76-sbck9-mzg.3.0.1_AS31_0.bin
```

2. Remove slot4 svcl config on SUP and boot slot4 from eobc by executing the following commands:
 - a. Reboot slot4 from eobc.



Note Executing the **no svc1c** command before resetting the module may cause the active side (module 3) to hang. You may need to reset module 4 before executing the **no svc1c** command.

```
SUP# hw-module module 4 boot eobc
SUP# hw-module module 4 reset
```



Note Card slot3 is functional as active without a backup (on slot3, peer state is FSM_FT_STATE_UNKNOWN). While the above command is executed, card in slot4 will show state as active and peer state of FSM_FT_STATE_UNKNOWN.

- b. Wait, and then during slot4 boot up, excute the following commands:

```
Sup(config)# no svc1c module 4 vlan-group 99,100,200
Sup(config)# end
```

Card in slot4 removed from svc1c.

Execute step 3 below after slot4 bootup (You can use the **session** command to connect to s lot 4).

3. Promote slot4 (with 3.1 to active) and migrate slot3 to 3.1:
- a. Remove slot3 from svc1c on SUP by executing the command:

```
Sup(config)# no svc1c module 3 vlan-group 99,100,200
```

Active calls on slot3 will be dropped, leading to total outage until (3b) is done.

- b. Add slot4 to svc1c on SUP by executing the command:

```
Sup(config)# svc1c module 4 vlan-group 99,100,200
```

Slot4 will start acting as Active, without a Standby. If failure, go to step 4

Billing for active slot is still not configured, so calls will not be billed until step 5.

Go to step 5 for billing.

4. If slot4 fails to come up as active, follow these steps:

- a. Add slot3 back to the svc1c as follows:

```
Sup(config)# svc1c module 3 vlan-groups 99,100,200
Sup(config)# end
```

- b. Change boot string to 3.0.2 and reset slot4:

```
Sup(config)# boot device module 4 disk0: c76-sbck9-mzg.3.0.1_AS30_2.bin
Sup(config)# end
SUP# hw-module module 4 boot config-register
SUP# hw-module module 4 reset
```

- c. Add slot4 to svc1c before it has booted up:

```
Sup(config)# svc1c module 4 vlan-group 99,100,200
```

Slot4 boots to 3.0.2 from image in disk0: of slot4.

Slot4 should come up as Standby with 3.0.2.

Upgrade failed, abort (collect console output to analyze failure. If there is a corefile on slot4, upload it to a tftpsrvr for offline analysis).

5. Add new billing configuration to slot4.

This is deployment specific, see the Billing chapter. You might want to have the configuration in a file where it can be pasted in sbc config mode.

6. Wait and verify new active Release 3.1.0 SBC behaviour is correct.
7. Modify slot3 boot configuration on sup by executing the commands:

```
Sup(config)# boot device module 3 disk0: c76-sbck9-mzg.3.0.1_AS31_0.bin
Sup(config)# end
```

8. Boot slot3 from eobc.

```
SUP# hw-module module 3 boot eobc
SUP# hw-module module 3 reset
```

Slot3 starts booting after a few seconds.

Execute step 8 below after executing the **hw-module module 3 reset** command. (Do not wait.)

9. Add slot3 to svclc immediately after reset above by executing the commands:

```
Sup(config)# svclc module 3 vlan-group 99,100,200
Sup(config)# end
```

10. If slot3 successfully comes up as Standby, change boot configuration for slot4 by executing the commands below, otherwise go to step 11:

```
SUP# hw-module module 4 boot config-register
slot4/Admin(config)# config-register 1
slot4/Admin(config)# boot system image: c76-sbck9-mzg.3.0.1_AS31_0.bin
slot4/Admin(config)# no boot system image: c76-sbck9-mzg.3.0.1_AS30_2.bin
slot4/Admin(config)# do write mem all
slot4/Admin(config)# end
```

11. Revert to slot3 being Active and slot4 as Standby:

```
slot3/Admin#: show ft group brief
My State:FSM_FT_STATE_STANDBY_HOT
```

The above output should appear for all the Ft groups on slot3.

- a. Now change slot3 to act as Active and slot4 as Standby by executing:

```
slot4/Admin# ft switchover
```

This command will cause card to switchover.

Slot3 becomes Active and slot4 comes up in Standby mode.

While slot4 is booting, slot3 is Active without a Standby.

- b. Change the boot configuration for slot3 by executing:

```
slot3/Admin(config)# hw-module module 3 boot config-register
slot3/Admin(config)# config-register 1
slot3/Admin(config)# boot system image: c76-sbck9-mzg.3.0.1_AS31_0.bin
slot3/Admin(config)# no boot system image: c76-sbck9-mzg.3.0.1_AS30_2.bin
slot3/Admin(config)# do write mem all
```

- c. Verify the status by executing the following commands and capturing the output:

```
slot3/Admin#: show ft group brief
slot4/Admin#: show ft group brief
```

Slot3 should indicate FSM_FT_STATE_ACTIVE and slot4 should indicate FSM_FT_STATE_STANDBY_HOT for all Ft groups (when slot4 is up).

- d. Execute the **show version** command on both slot3 and slot4 and capture the outputs.

Both SBCs should be at 3.1.0.

Upgrade is now complete.

- e. Execute the following command on both SBCs:

```
slot3/Admin#: clear cores
slot4/Admin#: clear cores
```

12. If slot3 fails to come up as standby in step 10:

- a. Remove slot3 from svclc:

```
Sup(config)# no svclc module 3 vlan-group 99,100,200
Sup(config)# end
```

- b. Change boot setting and reset slot3:

```
Sup# hw-module module 3 boot config-register
Sup# hw-module module 3 reset
Sup(config)# svclc module 3 vlan-group 99,100,200
```

Slot3 comes up with 3.0.x image from the ACE card disk.

- c. Remove slot4 from svclc. This leads to total outage until (d).

```
Sup(config)# no svclc module 4 vlan-group 99,100,200
```

- d. Wait for slot3 to come up as Active.

- e. Change boot setting for slot4 to 3.0.2 and reset slot4.

```
Sup# hw-module module 4 boot config-register
Sup# hw-module module 4 reset
```

Slot4 comes up with 3.0.x image from the ACE card disk.

- f. Immediately add slot4 to svclc:

```
Sup(config)# svclc module 4 vlan-group 99,100,200
Sup(config)# do write mem
```

Slot3 is Active and slot4 will be Standby when it comes up.

- g. Upgrade failed. Capture console output from sup, ace and any crash files from the ace for analysis.

Post Upgrade Steps

Context Configuration

SBC context configuration is automatically changed once upgraded to 3.1 from 3.0.x image. The previous configuration was of the form:

```
context <context-name>
  subcommands ...
```

New configuration will be of the form:

```
context <context-name> context-id <number>
  subcommands ...
```

The "context-id <number>" is auto-generated in Release 3.1.00. When new contexts are defined, it is recommended to add the full command, with an unused "number."

Billing Configuration

The billing configuration has changed. Please refer to the configuration guide to get the latest configuration commands.