Secure BIOS
High level
Unit test Report

19 September 2016

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BIOS_HIGH_FAILED_ATF_BOOT-1

This test covers two case, one for sucessfull boot and the other if boot function returns.

Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/hsbf_image.bin

Expected output

Parameter	Type	Value
rc	hex	16
bl31_load_address	hex	0xf9858000
bl33_load_address	hex	0x3800000
bl33_size	hex	n/a
bl31_size	hex	n/a
e_level	hex	2

Actual output

Parameter	Value
rc	16
bl31_load_address	0xf9858000
bl33_load_address	0x3800000
bl33_size	48464
bl31_size	36880
e_level	2

Exit code

Expected	0
Actual	0

Addtional info

Actual error output

No error message

Test info

[bl33_size] checked value [0x48464] is hexadecimal

[bl31_size] checked value [0x36880] is hexadecimal

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Test Criteria
    If Expected output match actual output , and
    exit code is [0] , then test will be reported [passed]

BIOS_HIGH_FAILED_VERIFY_ROOTPK-1

Difference between calculated and recieved hash must be detected
    Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/test/failed_verify_rootpk.bin

    Expected output

Parameter	Type	Value
rc	hex	2

    Actual output

Parameter	Value
rc	2

    Exit code
        Expected   0
        Actual   0

    Addtional info
        Actual error output
            No error message
        Test info
            No test info

    Test Criteria
        If Expected output match actual output , and
        exit code is [0] , then test will be reported [passed]

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BIOS_HIGH_FAILED_VERIFY_DRAM-1

DRAM module embedded in HSBF have bad signature

Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/test/failed_verify_dram.bin

Expected output

Parameter	Type	Value
rc	hex	4

Actual output

Parameter	Value
rc	4

Exit code

Expected	0
Actual	0

Addtional info

Actual error output

No error message

Test info

No test info

Test Criteria

If Expected output match actual output , and
exit code is [0] , then test will be reported [passed]

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BIOS_HIGH_ROOTPK_NOT_FOUND-1   5

Image without ROOT_PK object
Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/test/failed_no_rootpk.bin

Expected output

Parameter	Type	Value
rc	hex	3

Actual output

Parameter	Value
rc	3

Exit code

Expected	0
Actual	0

Addtional info
Actual error output
No error message
Test info
No test info

Test Criteria
If Expected output match actual output , and
exit code is [0] , then test will be reported [passed]

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BIOS_HIGH_DRAM_NOT_FOUND-1

Image without DRAM object
- Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/test/failed_no_dram.bin

Expected output

Parameter	Type	Value
rc	hex	5

Actual output

Parameter	Value
rc	5

Exit code
Expected	0
Actual	0

Addtional info
- Actual error output
  - No error message
- Test info
  - No test info

Test Criteria
If Expected output match actual output , and
exit code is [0] , then test will be reported [passed]

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BIOS_HIGH_FAILED_VERIFY_ATF_RUNTIME-1

Service module embedded in HSBF have bad signature
Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/test/failed_bad_atf_runtime.bin

Expected output

Parameter	Type	Value
rc	hex	11

Actual output

Parameter	Value
rc	11

Exit code
Expected   0
Actual   0

Addtional info
Actual error output
No error message
Test info
No test info

Test Criteria
If Expected output match actual output , and
exit code is [0] , then test will be reported [passed]

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BIOS_HIGH_FAILED_VERIFY_ATF_PAYLOAD-1

Payload module embedded in HSBF have bad signature
Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/test/failed_bad_atf_payload.bin

Expected output

Parameter	Type	Value
rc	hex	10

Actual output

Parameter	Value
rc	10

Exit code

Expected	0
Actual	0

Addtional info
Actual error output
No error message
Test info
No test info

Test Criteria
If Expected output match actual output , and
exit code is [0] , then test will be reported [passed]

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BIOS_HIGH_UNKNOWN_SIZE_HSBF-1

Size of Haspoc image not set in SDRAM object
    Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/hsbf_nosize_image.bin

Expected output

Parameter	Type	Value
rc	hex	12

Actual output

Parameter	Value
rc	12

Exit code
    Expected   0
    Actual   0

Addtional info
    Actual error output
        No error message
    Test info
        No test info

Test Criteria
    If Expected output match actual output , and
    exit code is [0] , then test will be reported [passed]

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BIOS_HIGH_FAILED_NO_BOOT_OBJECT-1

No boot object found
>   Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/hsbf_noboot_image.bin

>   Expected output

Parameter	Type	Value
rc	hex	13

>   Actual output

Parameter	Value
rc	13

>   Exit code

Expected	0
Actual	0

>   Addtional info
>>   Actual error output
>>>   No error message
>>   Test info
>>>   No test info

>   Test Criteria
>>   If Expected output match actual output , and
>>   exit code is [0] , then test will be reported [passed]

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BIOS_HIGH_FAILED_VERIFY_RAMDISK-1

ramdisk embedded in HSBF have bad signature

Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/test/failed_bad_ramdisk.bin

Expected output

Parameter	Type	Value
rc	hex	8

Actual output

Parameter	Value
rc	8

Exit code

Expected	0
Actual	0

Addtional info

Actual error output

No error message

Test info

No test info

Test Criteria

If Expected output match actual output , and
exit code is [0] , then test will be reported [passed]

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BIOS_HIGH_FAILED_UNKNOWN_OBJECT-1

Unknown object found in HSBF Image
> Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/test/failed_unsupported_type.bir

> Expected output

Parameter	Type	Value
rc	hex	9

> Actual output

Parameter	Value
rc	9

> Exit code

Expected	0
Actual	0

> Addtional info
>> Actual error output
>>> No error message
>> Test info
>>> No test info

> Test Criteria
>> If Expected output match actual output , and
>> exit code is [0] , then test will be reported [passed]

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BIOS_HIGH_BAD_STORAGE_READ-1

Could not read HSBF image from external storage into SRAM

Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/test/failed_short_read.bin

Expected output

Parameter	Type	Value
rc	hex	17

Actual output

Parameter	Value
rc	17

Exit code

Expected	0
Actual	0

Addtional info

Actual error output

Attempt to read sector [300] beyond partion size [291]

Test info

No test info

Test Criteria

If Expected output match actual output , and
exit code is [0] , then test will be reported [passed]

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BIOS_HIGH_BAD_STORAGE_READ-2

Could not read HSBF image from external storage into DRAM

    Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/test/failed_short_read2.bin

    Expected output

Parameter	Type	Value
rc	hex	17

    Actual output

Parameter	Value
rc	17

    Exit code

Expected	0
Actual	0

    Addtional info

        Actual error output

            Attempt to read sector [58594] beyond partion size [29773]

        Test info

            No test info

    Test Criteria

        If Expected output match actual output , and

        exit code is [0] , then test will be reported [passed]

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BIOS_HIGH_FAILED_ATF_BOOT-2

Test of large signed HSBF images
Input

Parameter	Type	Value
hsbf_file	path	$PREFIX/hikey_fip/test/payload_maxsize.bin

Expected output

Parameter	Type	Value
rc	hex	16
bl31_load_address	hex	0xf9858000
bl33_load_address	hex	0x3800000
bl33_size	hex	n/a
bl31_size	hex	n/a
e_level	hex	2

Actual output

Parameter	Value
rc	16
bl31_load_address	0xf9858000
bl33_load_address	0x3800000
bl33_size	15133440
bl31_size	36880
e_level	2

Exit code

Expected	0
Actual	0

Addtional info
Actual error output
No error message
Test info
[bl33_size] checked value [0x15133440] is hexadecimal

[bl31_size] checked value [0x36880] is hexadecimal

Test Criteria
If Expected output match actual output , and
exit code is [0] , then test will be reported [passed]

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BIOS_HIGH_FAILED_RETRIEVE_ROOT_PK_HASH-1

Obtain hash value needed to verify public key ROOT_PK

Addtional info
Actual error output
No error message
Test info
Function not covered by test

BIOS_HIGH_FAILED_INSTALL_ROOT_PK_HASH-1

Install ROOT_PK_HASH as trust anchor

Addtional info
Actual error output
No error message
Test info
Function not covered by test

BIOS_HIGH_MALLOC_SRAM_FAILED-1

Unable to allocate memory from Static memory

Addtional info
Actual error output
No error message
Test info
Function not covered by test

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BIOS_HIGH_MALLOC_DRAM_FAILED-1

Unable to allocate memory from dynamic memory

Addtional info
Actual error output
No error message
Test info
Function not covered by test

BIOS_HIGH_SDRAM_SETUP_ERROR-1

Unable to process bl30.bin

Addtional info
Actual error output
No error message
Test info
Function not covered by test

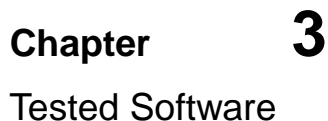# BIOS_HIGH_FAILED_INIT_STORAGE-1

Configuration of MMC Controller

Addtional info
Actual error output
No error message
Test info
Function not covered by test

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Chapter **3** .

Tested Software

libraries

File	Version
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/bios_high/branches/haspoc/hikey/bios_high/main.c	27062
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/bios_high/branches/haspoc/hikey/bios_high/bios_high.h	26907
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_generic/trunk/plf_generic/memory.h	20537
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_lsb_x86/trunk/plf_lsb_x86/plf/platform.h	18164
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_lsb_x86/trunk/plf_lsb_x86/memory.c	25901
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_lsb_x86/trunk/plf_lsb_x86/plf/platform.h	18164
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_lsb_x86/trunk/plf_lsb_x86/plf/platform.h	18164
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_lsb_x86/trunk/plf_lsb_x86/plf/platform.h	18164
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_lsb_x86/trunk/plf_lsb_x86/plf/platform.h	18164
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_lsb_x86/trunk/plf_lsb_x86/plf/platform.h	18164
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_lsb_x86/trunk/plf_lsb_x86/plf/platform.h	18164
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_lsb_x86/trunk/plf_lsb_x86/plf/platform.h	18164
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_generic/trunk/plf_generic/timer.h	16182
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_lsb_x86/trunk/plf_lsb_x86/plf/platform.h	18164
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_lsb_x86/trunk/plf_lsb_x86/timer.c	16183
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_generic/trunk/plf_generic/dir.h	8139
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_lsb_x86/trunk/plf_lsb_x86/dir.c	16123
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_generic/trunk/plf_generic/dynload.h	8122
https://cm-ext.dev.oniteo.com/svn/nanodev/packages/plf_lsb_x86/trunk/plf_lsb_x86/dynload.c	16123

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https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/plf_generic/trunk/plf_generic/ngetopt.h	8122
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/plf_lsb_x86/trunk/plf_lsb_x86/ngetopt.c	16123
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/plf_generic/trunk/plf_generic/safestr.h	17763
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/plf_lsb_x86/trunk/plf_lsb_x86/safestr.c	16124
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/plf_generic/trunk/plf_generic/plf_proc.h	13531
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/plf_lsb_x86/trunk/plf_lsb_x86/plf_proc.c	16123
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/plf_generic/trunk/plf_generic/system.h	24679
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/plf_lsb_x86/trunk/plf_lsb_x86/system.c	24361
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/plf_generic/trunk/plf_generic/file.h	24731
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/plf_lsb_x86/trunk/plf_lsb_x86/file.c	24738
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/spdlib/branches/haspoc/juno/spdlib/spd_install.c	26962
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/spdlib/branches/haspoc/juno/spdlib/spd.h	26876
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/spdlib/branches/haspoc/juno/spdlib/spd_verify.c	26962
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/secure_bios/branches/haspoc/hikey/secure_bios/pki/rsa_ver.c	26466
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/secure_bios/branches/haspoc/hikey/secure_bios/pki/rsa_ver.h	24674
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/secure_bios/branches/haspoc/hikey/secure_bios/pki/bignum.c	26005
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/secure_bios/branches/haspoc/hikey/secure_bios/pki/bignum.h	17411
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/secure_bios/branches/haspoc/hikey/secure_bios/pki/rsa_math.c	25403
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/secure_bios/branches/haspoc/hikey/secure_bios/pki/rsa_math.h	17411
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/secure_bios/branches/haspoc/hikey/secure_bios/pki/sha2.c	26394
https://cm-ext.dev.oniteo.com/svn/nanodev/pack-ages/secure_bios/branches/haspoc/hikey/secure_bios/pki/sha2.h	26394

binaries

File	Version

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Chapter   **4**   .

Test Spec

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Test Vector
Requirements used for test

```
[info]
type=info

[BIOS_HIGH_FAILED_ATF_BOOT-1]
type=req
group=Boot
req_type=Functional
level=MUST
prio=HIGH
brief=ATF Boot failure
description=This test covers two case, one for sucessfull boot and the other if boot function
returns.
link=bios_high/format

test_type=cmd
input=hsbf_file
input.hsbf_file=path,$PREFIX/hikey_fip/hsbf_image.bin

output=rc,bl31_load_address,bl33_load_address,bl33_size,bl31_size,e_level
output.e_level=hex,2
output.rc=hex,16
output.bl31_load_address=hex,0xf9858000
output.bl33_load_address=hex,0x3800000
output.bl33_size=hex
output.bl31_size=hex
;output.bl33_X0=hex
;output.bl33_X1=hex

exitcode=0,passed

[BIOS_HIGH_FAILED_VERIFY_ROOTPK-1]
type=req
group=Crypto
req_type=Functional
level=MUST
prio=HIGH
brief=Broken ROOT_PK hash in image
```

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```
description=Difference between calculated and recieved hash must be detected
link=bios_high/format

test_type=cmd
input=hsbf_file
input.hsbf_file=path,$PREFIX/hikey_fip/test/failed_verify_rootpk.bin
output=rc
output.rc=hex,2
exitcode=0,passed

[BIOS_HIGH_FAILED_VERIFY_DRAM-1]
type=req
group=Crypto
req_type=Functional
level=MUST
prio=HIGH
brief=Broken DRAM signature in image
description=DRAM module embedded in HSBF have bad signature
link=bios_high/format

test_type=cmd
input=hsbf_file
input.hsbf_file=path,$PREFIX/hikey_fip/test/failed_verify_dram.bin
output=rc
output.rc=hex,4
exitcode=0,passed

[BIOS_HIGH_ROOTPK_NOT_FOUND-1]
type=req
group=Config
req_type=Functional
level=MUST
prio=HIGH
brief=Missing ROOT_PK in image
description=Image without ROOT_PK object
link=bios_high/format

test_type=cmd
input=hsbf_file
input.hsbf_file=path,$PREFIX/hikey_fip/test/failed_no_rootpk.bin
output=rc
output.rc=hex,3
exitcode=0,passed

[BIOS_HIGH_DRAM_NOT_FOUND-1]
type=req
group=Config
req_type=Functional
level=MUST
prio=HIGH
brief=Missing DRAM in image
description=Image without DRAM object
link=bios_high/format
```

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```
test_type=cmd
input=hsbf_file
input.hsbf_file=path,$PREFIX/hikey_fip/test/failed_no_dram.bin
output=rc
output.rc=hex,5
exitcode=0,passed


[BIOS_HIGH_FAILED_VERIFY_ATF_RUNTIME-1]
type=req
group=Crypto
req_type=Functional
level=MUST
prio=HIGH
brief=Bad ATF runtime signature
description=Service module embedded in HSBF have bad signature
link=bios_high/format


test_type=cmd
input=hsbf_file
input.hsbf_file=path,$PREFIX/hikey_fip/test/failed_bad_atf_runtime.bin
output=rc
output.rc=hex,11
exitcode=0,passed


[BIOS_HIGH_FAILED_VERIFY_ATF_PAYLOAD-1]
type=req
group=Crypto
req_type=Functional
level=MUST
prio=HIGH
brief=Bad ATF payload signature
description=Payload module embedded in HSBF have bad signature
link=bios_high/format


test_type=cmd
input=hsbf_file
input.hsbf_file=path,$PREFIX/hikey_fip/test/failed_bad_atf_payload.bin
output=rc
output.rc=hex,10
exitcode=0,passed


[BIOS_HIGH_UNKNOWN_SIZE_HSBF-1]
type=req
group=Storage
req_type=Functional
level=MUST
prio=HIGH
brief=Unknown size
description=Size of Haspoc image not set in SDRAM object
link=bios_high/format


test_type=cmd
input=hsbf_file
```

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```
        input.hsbf_file=path,$PREFIX/hikey_fip/hsbf_nosize_image.bin
        output=rc
        output.rc=hex,12
        exitcode=0,passed

        [BIOS_HIGH_FAILED_NO_BOOT_OBJECT-1]
        type=req
        group=Config
        req_type=Functional
        level=MUST
        prio=HIGH
        brief=Missing boot object
        description=No boot object found
        link=bios_high/format

        test_type=cmd
        input=hsbf_file
        input.hsbf_file=path,$PREFIX/hikey_fip/hsbf_noboot_image.bin
        output=rc
        output.rc=hex,13
        exitcode=0,passed

        [BIOS_HIGH_FAILED_VERIFY_RAMDISK-1]
        type=req
        group=Crypto
        req_type=Functional
        level=MUST
        prio=HIGH
        brief=Bad ramdisk signature
        description=ramdisk embedded in HSBF have bad signature
        link=bios_high/format

        test_type=cmd
        input=hsbf_file
        input.hsbf_file=path,$PREFIX/hikey_fip/test/failed_bad_ramdisk.bin
        output=rc
        output.rc=hex,8
        exitcode=0,passed

        [BIOS_HIGH_FAILED_UNKNOWN_OBJECT-1]
        type=req
        group=Config
        req_type=Functional
        level=MUST
        prio=HIGH
        brief=Unsupported object
        description=Unknown object found in HSBF Image
        link=bios_high/format

        test_type=cmd
        input=hsbf_file
        input.hsbf_file=path,$PREFIX/hikey_fip/test/failed_unsupported_type.bin
        output=rc
```

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```
output.rc=hex,9
exitcode=0,passed

[BIOS_HIGH_BAD_STORAGE_READ-1]
type=req
group=Storage
req_type=Functional
level=MUST
prio=HIGH
brief=Error during short read
description=Could not read HSBF image from external storage into SRAM
link=bios_high/format

test_type=cmd
input=hsbf_file
input.hsbf_file=path,$PREFIX/hikey_fip/test/failed_short_read.bin
output=rc
output.rc=hex,17
exitcode=0,passed

[BIOS_HIGH_BAD_STORAGE_READ-2]
type=req
group=Storage
req_type=Functional
level=MUST
prio=HIGH
brief=Error during full read
description=Could not read HSBF image from external storage into DRAM
link=bios_high/format

test_type=cmd
input=hsbf_file
input.hsbf_file=path,$PREFIX/hikey_fip/test/failed_short_read2.bin
output=rc
output.rc=hex,17
exitcode=0,passed

[BIOS_HIGH_FAILED_ATF_BOOT-2]
type=req
group=Crypto
req_type=Functional
level=MUST
prio=HIGH
brief=Bad ATF boot signature
description=ATF boot embedded in HSBF have bad signature
link=bios_high/format

test_type=cmd
input=hsbf_file
input.hsbf_file=path,$PREFIX/hikey_fip/test/failed_bad_atf_boot.bin
output=rc
output.rc=hex,7
exitcode=0,passed
```

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[BIOS_HIGH_FAILED_RETRIEVE_ROOT_PK_HASH-1]
type=req
group=Crypto
req_type=Functional
level=MUST
prio=HIGH
brief=Read hash from target
description=Obtain hash value needed to verify public key ROOT_PK
link=bios_high/format
test_type=cmd
disable_test=1

[BIOS_HIGH_FAILED_INSTALL_ROOT_PK_HASH-1]
type=req
group=Crypto
req_type=Functional
level=MUST
prio=HIGH
brief=Use hash as trust anchor
description=Install ROOT_PK_HASH as trust anchor
link=bios_high/format
test_type=cmd
disable_test=1

[BIOS_HIGH_MALLOC_SRAM_FAILED-1]
type=req
group=Platform
req_type=Functional
level=MUST
prio=HIGH
brief=Allocate heap from SRAM
description=Unable to allocate memory from Static memory
link=bios_high/format
test_type=cmd
disable_test=1

[BIOS_HIGH_MALLOC_DRAM_FAILED-1]
type=req
group=Platform
req_type=Functional
level=MUST
prio=HIGH
brief=Allocate heap from DRAM
description=Unable to allocate memory from dynamic memory
link=bios_high/format
test_type=cmd
disable_test=1

[BIOS_HIGH_FAILED_ATF_BOOT-2]
type=req
group=Performance
req_type=Functional

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```
level=MUST
prio=HIGH
brief=Size limits
description=Test of large signed HSBF images
link=bios_high/format

test_type=cmd
input=hsbf_file
input.hsbf_file=path,$PREFIX/hikey_fip/test/payload_maxsize.bin

output=rc,bl31_load_address,bl33_load_address,bl33_size,bl31_size,e_level
output.e_level=hex,2
output.rc=hex,16
output.bl31_load_address=hex,0xf9858000
output.bl33_load_address=hex,0x3800000
output.bl33_size=hex
output.bl31_size=hex
;output.bl33_X0=hex
;output.bl33_X1=hex

exitcode=0,passed
[BIOS_HIGH_SDRAM_SETUP_ERROR-1]
type=req
group=SDRAM
req_type=Functional
level=MUST
prio=HIGH
brief=SDRAM Config
description=Unable to process bl30.bin
link=bios_high/format
test_type=cmd
disable_test=1

[BIOS_HIGH_FAILED_INIT_STORAGE-1]
type=req
group=SDRAM
req_type=Functional
level=MUST
prio=HIGH
brief=Storage init
description=Configuration of MMC Controller
link=bios_high/format
test_type=cmd
disable_test=1
```

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Chapter 5 .

Test log

Unit test
Bios high functional test

```
DEBUG Enabled

Test spec: rs.ini

Command: /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test
```

```
Boot                BIOS_HIGH_FAILED_ATF_BOOT-1

 export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\
 LD_LIBRARY_PATH=/opt/haspoc/lib \
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/hsbf_image.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
ROOT_PK_HASH installed
ROOT_PK found in HSBF (pass1)
main.c:_main:96:

ROOT_PK verified


ROOT_PK installed
HSBF Image ID=[Divided objects]
SDRAM found in HSBF (pass1)
main.c:_main:122: About to assign 50000000 bytes starting at 0x4000 for heap
SDRAM Verified image_size = 0/15243296
main.c:_main:152: 15243296 bytes allocated, about to read from eMMC into 0x94970010
main.c:_main:164: HSBF processing node of type 1 len=15243296
main.c:_main:168:

ROOT_PK Ignored 5

main.c:_main:164: HSBF processing node of type 4 len=15242904
```

```
main.c:_main:172:

SDRAM Ignored 1

main.c:_main:164: HSBF processing node of type 8 len=15094512
ATF_RUNTIME found in HSBF
main.c:_main:214: verify ok 1
main.c:_main:164: HSBF processing node of type 9 len=15055944
ATF_PAYLOAD found in HSBF
main.c:_main:227: verify ok 1
main.c:_main:164: HSBF processing node of type 5 len=15005792
RAMDISK found in HSBF
main.c:_main:202: verify ok 1
main.c:_main:164: HSBF processing node of type 3 len=1728
ATF_BOOT found in HSBF
main.c:_main:182: verify ok 1
e_level 2
bl31_load_address 0xf9858000
bl33_load_address 0x3800000
bl33_size 48464
bl31_size 36880
main.c:_main:190: Failed to boot -1
rc 16

 err_out:
Nr of logs to include 0


_____
Crypto               BIOS_HIGH_FAILED_VERIFY_ROOTPK-1

 export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\
 LD_LIBRARY_PATH=/opt/haspoc/lib \
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/test/failed_verify_rootpk.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
ROOT_PK_HASH installed
ROOT_PK found in HSBF (pass1)
main.c:_main:92:

ROOT_PK Failed to verify 2


rc 2

 err_out:
Nr of logs to include 0


_____
Crypto               BIOS_HIGH_FAILED_VERIFY_DRAM-1
```

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_____

```
 export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\
 LD_LIBRARY_PATH=/opt/haspoc/lib \
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/test/failed_verify_dram.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
ROOT_PK_HASH installed
ROOT_PK found in HSBF (pass1)
main.c:_main:96:

ROOT_PK verified


ROOT_PK installed
HSBF Image ID=[failed verify dram]
SDRAM found in HSBF (pass1)
main.c:_main:116: Failed to verify 2
rc 4

 err_out:
Nr of logs to include 0
```

_____

Config   BIOS_HIGH_ROOTPK_NOT_FOUND-1

```
 export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\
 LD_LIBRARY_PATH=/opt/haspoc/lib \
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/test/failed_no_rootpk.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
ROOT_PK_HASH installed
main.c:_main:108: Expected ROOT_PK 1 4
rc 3

 err_out:
Nr of logs to include 0
```

_____

Config   BIOS_HIGH_DRAM_NOT_FOUND-1

```
 export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\
 LD_LIBRARY_PATH=/opt/haspoc/lib \
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/test/failed_no_dram.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
```

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```
ROOT_PK_HASH installed
ROOT_PK found in HSBF (pass1)
main.c:_main:96:

ROOT_PK verified


ROOT_PK installed
HSBF Image ID=[No Dram ]
main.c:_main:137: Expected SDRAM 4 8
rc 5

 err_out:
Nr of logs to include 0
```

_____

```
Crypto              BIOS_HIGH_FAILED_VERIFY_ATF_RUNTIME-1

 export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\
 LD_LIBRARY_PATH=/opt/haspoc/lib \
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/test/failed_bad_atf_runtime.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
ROOT_PK_HASH installed
ROOT_PK found in HSBF (pass1)
main.c:_main:96:

ROOT_PK verified


ROOT_PK installed
HSBF Image ID=[Failed ATF Runtime]
SDRAM found in HSBF (pass1)
main.c:_main:122: About to assign 50000000 bytes starting at 0x1024 for heap
SDRAM Verified image_size = 0/15243048
main.c:_main:152: 15243048 bytes allocated, about to read from eMMC into 0x18703010
main.c:_main:164: HSBF processing node of type 1 len=15243048
main.c:_main:168:

ROOT_PK Ignored 5

main.c:_main:164: HSBF processing node of type 4 len=15242656
main.c:_main:172:

SDRAM Ignored 1

main.c:_main:164: HSBF processing node of type 8 len=15094264
ATF_RUNTIME found in HSBF
main.c:_main:210: Failed to verify 2
rc 11
```

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_____

   err_out:
Nr of logs to include 0

_____

Crypto   BIOS_HIGH_FAILED_VERIFY_ATF_PAYLOAD-1

 export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\
 LD_LIBRARY_PATH=/opt/haspoc/lib \
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/test/failed_bad_atf_payload.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
ROOT_PK_HASH installed
ROOT_PK found in HSBF (pass1)
main.c:_main:96:

ROOT_PK verified

ROOT_PK installed
HSBF Image ID=[Failed ATF payload]
SDRAM found in HSBF (pass1)
main.c:_main:122: About to assign 50000000 bytes starting at 0x1024 for heap
SDRAM Verified image_size = 0/15243048
main.c:_main:152: 15243048 bytes allocated, about to read from eMMC into 0xafcc9010
main.c:_main:164: HSBF processing node of type 1 len=15243048
main.c:_main:168:

ROOT_PK Ignored 5

main.c:_main:164: HSBF processing node of type 4 len=15242656
main.c:_main:172:

SDRAM Ignored 1

main.c:_main:164: HSBF processing node of type 8 len=15094264
ATF_RUNTIME found in HSBF
main.c:_main:214: verify ok 1
main.c:_main:164: HSBF processing node of type 9 len=15055696
ATF_PAYLOAD found in HSBF
main.c:_main:223: Failed to verify 2
rc 10

   err_out:
Nr of logs to include 0

_____

Storage   BIOS_HIGH_UNKNOWN_SIZE_HSBF-1

 export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\

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```
 LD_LIBRARY_PATH=/opt/haspoc/lib \
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/hsbf_nosize_image.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
ROOT_PK_HASH installed
ROOT_PK found in HSBF (pass1)
main.c:_main:96:

ROOT_PK verified


ROOT_PK installed
HSBF Image ID=[Divided objects]
SDRAM found in HSBF (pass1)
main.c:_main:122: About to assign 50000000 bytes starting at 0x4000 for heap
SDRAM Verified image_size = 0/0
rc 12

 err_out:
Nr of logs to include 0
```

_____

```
Config                  BIOS_HIGH_FAILED_NO_BOOT_OBJECT-1

 export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\
 LD_LIBRARY_PATH=/opt/haspoc/lib \
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/hsbf_noboot_image.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
ROOT_PK_HASH installed
ROOT_PK found in HSBF (pass1)
main.c:_main:96:

ROOT_PK verified


ROOT_PK installed
HSBF Image ID=[No boot entry ]
SDRAM found in HSBF (pass1)
main.c:_main:122: About to assign 50000000 bytes starting at 0x1024 for heap
SDRAM Verified image_size = 0/237504
main.c:_main:152: 237504 bytes allocated, about to read from eMMC into 0x18129010
main.c:_main:164: HSBF processing node of type 1 len=237504
main.c:_main:168:

ROOT_PK Ignored 5

main.c:_main:164: HSBF processing node of type 4 len=237112
```

_____

```
main.c:_main:172:

SDRAM Ignored 1

main.c:_main:164: HSBF processing node of type 8 len=88720
ATF_RUNTIME found in HSBF
main.c:_main:214: verify ok 1
main.c:_main:164: HSBF processing node of type 9 len=50152
ATF_PAYLOAD found in HSBF
main.c:_main:227: verify ok 1
rc 13

 err_out:
Nr of logs to include 0
```

```
Crypto                BIOS_HIGH_FAILED_VERIFY_RAMDISK-1

 export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\
 LD_LIBRARY_PATH=/opt/haspoc/lib \
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/test/failed_bad_ramdisk.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
ROOT_PK_HASH installed
ROOT_PK found in HSBF (pass1)
main.c:_main:96:

ROOT_PK verified


ROOT_PK installed
HSBF Image ID=[Failed ramdisk]
SDRAM found in HSBF (pass1)
main.c:_main:122: About to assign 50000000 bytes starting at 0x1024 for heap
SDRAM Verified image_size = 0/15243048
main.c:_main:152: 15243048 bytes allocated, about to read from eMMC into 0xafbee010
main.c:_main:164: HSBF processing node of type 1 len=15243048
main.c:_main:168:

ROOT_PK Ignored 5

main.c:_main:164: HSBF processing node of type 4 len=15242656
main.c:_main:172:

SDRAM Ignored 1

main.c:_main:164: HSBF processing node of type 8 len=15094264
ATF_RUNTIME found in HSBF
main.c:_main:214: verify ok 1
main.c:_main:164: HSBF processing node of type 9 len=15055696
```

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ATF_PAYLOAD found in HSBF
main.c:_main:227: verify ok 1
main.c:_main:164: HSBF processing node of type 5 len=15005544
RAMDISK found in HSBF
main.c:_main:198: Failed to verify 2
rc 8

 err_out:
Nr of logs to include 0

_____

Config   BIOS_HIGH_FAILED_UNKNOWN_OBJECT-1

 export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\
 LD_LIBRARY_PATH=/opt/haspoc/lib \
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/test/failed_unsupported_type.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
ROOT_PK_HASH installed
ROOT_PK found in HSBF (pass1)
main.c:_main:96:

ROOT_PK verified

ROOT_PK installed
HSBF Image ID=[Unsupported type]
SDRAM found in HSBF (pass1)
main.c:_main:122: About to assign 50000000 bytes starting at 0x1024 for heap
SDRAM Verified image_size = 0/187352
main.c:_main:152: 187352 bytes allocated, about to read from eMMC into 0x56d14010
main.c:_main:164: HSBF processing node of type 1 len=187352
main.c:_main:168:

ROOT_PK Ignored 5

main.c:_main:164: HSBF processing node of type 4 len=186960
main.c:_main:172:

SDRAM Ignored 1

main.c:_main:164: HSBF processing node of type 100 len=38568
rc 9

 err_out:
Nr of logs to include 0

_____

Storage   BIOS_HIGH_BAD_STORAGE_READ-1

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_____

```
   export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\
 LD_LIBRARY_PATH=/opt/haspoc/lib \
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/test/failed_short_read.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
ROOT_PK_HASH installed
main.c:_main:84: Bad storage read -1
rc 17

 err_out: Attempt to read sector [300] beyond partion size [291]


Nr of logs to include 0
```

_____

```
Storage                 BIOS_HIGH_BAD_STORAGE_READ-2

   export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\
 LD_LIBRARY_PATH=/opt/haspoc/lib \
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/test/failed_short_read2.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
ROOT_PK_HASH installed
ROOT_PK found in HSBF (pass1)
main.c:_main:96:

ROOT_PK verified


ROOT_PK installed
HSBF Image ID=[Divided objects]
SDRAM found in HSBF (pass1)
main.c:_main:122: About to assign 50000000 bytes starting at 0x4000 for heap
SDRAM Verified image_size = 0/30000000
main.c:_main:152: 30000000 bytes allocated, about to read from eMMC into 0x74563010
main.c:_main:155: Bad storage read -1
rc 17

 err_out: Attempt to read sector [58594] beyond partion size [29773]


Nr of logs to include 0
```

_____

```
Performance             BIOS_HIGH_FAILED_ATF_BOOT-2

   export PREFIX=/opt/haspoc ; export BUILD_ROOT=/opt/haspoc ; export SYSTEM_ROOT=/opt/haspoc ;
\
 LD_LIBRARY_PATH=/opt/haspoc/lib \
```

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_____

```
 /opt/trusted_arm/packages/bios_high/bios_high/test_dir/main_test \
 $PREFIX/hikey_fip/test/payload_maxsize.bin
 Exit code 0
 std_out: main.c:_main:51: SUITE_BUILD_ID 761055
ROOT_PK_HASH retreved
ROOT_PK_HASH installed
ROOT_PK found in HSBF (pass1)
main.c:_main:96:

ROOT_PK verified


ROOT_PK installed
HSBF Image ID=[Max Size]
SDRAM found in HSBF (pass1)
main.c:_main:122: About to assign 100000000 bytes starting at 0x4000 for heap
SDRAM Verified image_size = 0/48880336
main.c:_main:152: 48880336 bytes allocated, about to read from eMMC into 0x87691010
main.c:_main:164: HSBF processing node of type 1 len=48880336
main.c:_main:168:

ROOT_PK Ignored 5

main.c:_main:164: HSBF processing node of type 4 len=48879944
main.c:_main:172:

SDRAM Ignored 1

main.c:_main:164: HSBF processing node of type 8 len=48731552
ATF_RUNTIME found in HSBF
main.c:_main:214: verify ok 1
main.c:_main:164: HSBF processing node of type 5 len=48692984
RAMDISK found in HSBF
main.c:_main:202: verify ok 1
main.c:_main:164: HSBF processing node of type 9 len=15136856
ATF_PAYLOAD found in HSBF
main.c:_main:227: verify ok 1
main.c:_main:164: HSBF processing node of type 3 len=1728
ATF_BOOT found in HSBF
main.c:_main:182: verify ok 1
e_level 2
bl31_load_address 0xf9858000
bl33_load_address 0x3800000
bl33_size 15133440
bl31_size 36880
main.c:_main:190: Failed to boot -1
rc 16

 err_out:
Nr of logs to include 0


_____

Crypto              BIOS_HIGH_FAILED_RETRIEVE_ROOT_PK_HASH-1
```

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_____

 Function not covered by test

_____

Crypto   BIOS_HIGH_FAILED_INSTALL_ROOT_PK_HASH-1

 Function not covered by test

_____

Platform   BIOS_HIGH_MALLOC_SRAM_FAILED-1

 Function not covered by test

_____

Platform   BIOS_HIGH_MALLOC_DRAM_FAILED-1

 Function not covered by test

_____

SDRAM   BIOS_HIGH_SDRAM_SETUP_ERROR-1

 Function not covered by test

_____

SDRAM   BIOS_HIGH_FAILED_INIT_STORAGE-1

 Function not covered by test

_____