



Boot Integrity Visibility

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Feature history for boot integrity visibility

This table provides release and related information for the feature explained in this module.

This feature is also available in all the releases subsequent to the one in which they are introduced in, unless noted otherwise.

Table 1: Feature History for Boot Integrity Visibility

Release	Feature Information
Cisco IOS XE 17.4.1	This feature was introduced.

Boot integrity visibility

Boot integrity visibility is a security feature that

- makes Cisco platform identity and software integrity information visible,
- enables verification of the boot process through checksum evaluation, and
- assists in ensuring that only trusted code is booted on the platform.

Platform identity provides the platform’s manufacturing installed identity. Software integrity exposes boot integrity measurements used to assess if trusted code has been booted.

During the boot process, the software creates a checksum record of each bootloader stage, which can be compared against a Cisco-certified record to verify the authenticity of the software image. Mismatched checksum values might indicate a non-Cisco certified or altered software image.

Verify software image and hardware

Verify the integrity of the device's software image and hardware by retrieving and reviewing the checksum records created during switch bootup.

This task describes how to retrieve the checksum record that was created during a switch bootup.

Enter the following commands in privileged EXEC mode. The messages % Error retrieving SUDI certificate and % Error retrieving integrity data signify a real CLI failure.



Note On executing the following commands, you might see the message % Please Try After a Few Seconds displayed on the CLI. This does not indicate a CLI failure, but indicates setting up of underlying infrastructure required to get the required output. We recommend waiting for a few minutes and then try the command again.

Procedure

Step 1 View the checksum record for a specific SUDI

Example:

```
Device# show platform sudi certificate sign nonce 123
```

Displays checksum record for the specific SUDI.

- (Optional) **sign** - Shows signature
- (Optional) **nonce** *nonce* - Enter a nonce value

Step 2 View the checksum record for boot stages

Example:

```
Device# show platform integrity sign nonce 123
```

Displays checksum record for boot stages.

- (Optional) **sign** - Shows signature
- (Optional) **nonce** *nonce* - Enter a nonce value

You obtain the checksum records for the device's software image and hardware, confirming their integrity or identifying any issues.

Verify platform identity and software integrity

Verify platform identity

The following example displays the Secure Unique Device Identity (SUDI) chain in PEM format. Each SUDI includes the Product ID (PID) and serial number (SN), so you can uniquely identify each device on a large network.

The first certificate is the Cisco Root CA 2048, and the second is the Cisco subordinate CA (ACT2 SUDI CA). You can verify both certificates by comparing them with those published on <https://www.cisco.com/security/pki/>. The third certificate is the SUDI certificate.



Important The CLI outputs in this document are examples for your reference. Your output may differ depending on the configuration of your device.

```
Device# show platform sudi certificate sign nonce 123
-----BEGIN CERTIFICATE-----
MIIDQzCCAiuGAWIBAgIQX/h7KctU3I1CoxW1aMmt/zANBgkqhkiG9w0BAQUFADA1
MRYwFAYDVQQKEw1DaXNjbyBTeXN0ZW1zMRSwGQYDVQQDEwJDaXNjbyBSb290IENB
IDIwNDgwHhcNMDQwNTE0MjAxNzEyWhcNMjkwNTE0MjAyNTQyWjA1MRYwFAYDVQQK
Ew1DaXNjbyBTeXN0ZW1zMRSwGQYDVQQDEwJDaXNjbyBSb290IENBIDIwNDgwggEg
MA0GCSqGSIb3DQEBAQUAA4IBDQAwggEIAoIBAQCWmrmp68Kd6f1cba0ZmKUEIhH
xmJVhEAYv8CrLqUccda8bnuoqrpu0hWIESEWdovyD0My5jOAmAHBKeN8hF570YQXJ
FcjPftolYYmUQ6iEqDGYeJu5Tm8sUxJsZr2tKyS7McQr/4NEb7Y9JHcJ6r8qqB9q
VvYgDxFU14FlpyXOWWqCZe+36ufijXWLBvLdT6ZeYpzPEApk0E5tzivMW/VgPSdH
jWn0f84bcN5wGyDWbs2mAag8EtKpP6BrXruOIIt6keOla06g58QBdKhTCytKmg9l
Eg6CTY5j/e/rmxrbU6YTYK/CfdfHbBcl1HP7R2RQgYCUTOG/rksc35LtLgXfAgED
olEwTzALBgNVHQ8EBAMCAYYwDwYDVR0TAQH/BAUwAwEB/zAdBgNVHQ4EFgQUUJ/PI
FR5umgIJFq0roIlgX9p7L6owEAYJKwYBBAGCNxUBBAMCAQAwDQYJKoZIhvcNAQEF
BQADggEBAJ2dhISjQa18dwy3U8pORFbi71R803UXHOjgxkhLtv5MOhmBvRbW7hmW
Yqpao2TB9k5UM8Z3/sUcuuVdJcr18JOagxEu5sv4dEX+5wW4q+ffY0vhN4TauYuX
cB7w4ovXsNgOnbFp1iQRe6lJT37mjpXYgyc8lWhJdTsD9i7rp77rMKSsH0T8lasz
Bvt9YArEtIpjsJyp8qS5UwGH0GikJ3+r/+n6yUA4iGe0OcaEb1fJU9u6ju7AQ7L4
CYNu/2bPPu8Xs1gYJQk0XuPL1hS27PKSb3TkL4Eq1ZKR4OCXPDJoBYVL0fdX4lId
kxpUnwVwWepxYB5DC2Ae/qPogRnhCzU=
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIIEPDCCAYsGAWIBAgIKYQlufQAAAAAADANBgkqhkiG9w0BAQUFADA1MRYwFAYD
VQQKEw1DaXNjbyBTeXN0ZW1zMRSwGQYDVQQDEwJDaXNjbyBSb290IENBIDIwNDgw
HhcNMTEwNjMwMTc1NjU3WhcNMjkwNTE0MjAyNTQyWjA1MRYwFAYDVQQKEw1DaXNj
bzEVMBMGAlUEAxMMQUNUMiBTvURJIENBMTIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8A
MIIBCgKCAQEAOm5l3THixA9tN/hS5qR/6UZRpdd+9aE2JbFkNjht6gfHKd477AkS
5XAtUs5oxDYVt/zEbs1Zq3+LR6qrqKKQVu6JYvH05UYLBqCj38s76NLk53905Wzp
9pRcmRCPuX+a6tHF/qRuOiJ44mdeDYZo3qPCpxzprWJDPclM4iYKHuMQmqmgmg+
xghHIooWS80BOcdiynEbeP5rZ7qRuewKmpl1TiI3WdBNjZjnpfjg66F+P4SaDkGb
BXdgJ13oVeF+EyFWLrFjj97fL2+8oauV43Qrvnf3d/GfQXj7ew+z/sX1XtEOjSXJ
URsyMej53Rdd9tJwHky8neapszS+r+kdVQIDAQABo4IBWjCCAVYwCwYDVR0PBAQD
AgHGMB0GA1UdDgQWBRI2PHxwnDVW7t8cwmTr7i4MAP4fzAfBgNVHSMEGDAwBQn
88gVHm6aAgkWrSugiWbF2nsvqjBDBgNVHR8EPDA6MDigNqA0hjJodHRwOi8vd3d3
LmNpc2NwLmNvbS9zZW50cm10eS9wa2kvY3JsL2NyY2EyMDQ4LmNybDBQBggrBgEF
BQcBAQREMEIwQAYIKwYBBQUHMAKGNGh0dHA6Ly93d3cuY2l2Y28uY29tL3N1Y3Vy
aXR5L3Brc29jZjZjcmNhMjA0OC5jZlIwXAYDVROgBFUwUzBRBgorBgEEAQKv
AQwAMEMwQQYIKwYBBQUHAGEWNNWh0dHA6Ly93d3cuY2l2Y28uY29tL3N1Y3VyYXR5
L3Brc29wbn2xpY2l1cy9pbmRlcE5odG1sMBIGA1UdEwEB/wQIMAYBAf8CAQAwDQYJ
KoZIhvcNAQEFBQADggEBAgh1qclr9tx4hzWgDERm37lyeuEmqcIfi9b9+GbMSJbi
ZHc/CcC10lJu0a9zTXA9w47H9/t6leduGxb4WeLxcwCiUgvFtCa51Iklt8nNbcKY
/4dw1ex+7amATUQO4QggIE67wVIPu6bgAE3Ja/nRS3xKYSnj8H5TehimBSv6TECi
```

9/10/2017 10:00 AM


```
Boot 0 Version: R04.1173930452019-06-11
Boot 0 Hash: A6C92C44976FC77DD42234444FFD87798FB9036A2762FAA4999A190A0258B18C
Boot Loader Version: 16.12(1r)
Boot Loader Hash:
#####
OS Version: 2020-03-19_20.26
OS Hashes:
C9800-L-universalk9_wlc.2020-03-19_20.26.SSA.bin:
53E2DF1A1A082E36FA4CAB817C1794EC9D69A0E90BC0BFECF9BC0BCA9385AA9E9372ABF7431E4A08FC5E5B9670131C09D158E5B8A7B457501FE77AB9F1C26D
C9800-L-mono-universalk9_wlc.2020-03-19_20.26.SSA.pkg:
1D3279D53B0311CE42C669824DF86FB5596CD7CA45CA8D7FDC3D10657B8C9A48F4B0508D7BCFFD645CB6571AC1E674A57A82414E3D6E1666BE64E6132F707671
PCR0: EE14A2D5099DA343B3941C54A429C4AC1D3EE8E9B609F1AC00049768A470734E
PCR8: 78794D0F5667F8FA4E425E3CA2AF3CD99B90B219FD90222D622B3D563416BBAA
```



Note Only OS and package hashes are supported.
