Kernel Minidump and Trustzone Upgrade

Information About Kernel Minidump and Trustzone Upgrade

When a kernel crash occurs on 802.11AX APs, only AP console logs are accessible for identifying the cause of the crash. However, these logs often do not provide sufficient information to pinpoint the exact reason for the crash. From Cisco IOS XE 17.14.1 release, the Kernel Minidump and Trustzone Upgrade feature offers a more effective method for diagnosing kernel crashes.

The Kernel Minidump and Trustzone Upgrade feature helps to collect specific sections and data structures containing essential information for debugging kernel crashes within the driver. When you enable this feature, it stores references to crucial kernel or driver data structures and data in a TLV structure within kernel memory. Subsequently, after the AP crash and reboot process, the TLV-referenced data structures are saved to the flash memory and can be exported for further analysis. The TLV data is stored in the */storage/cores* directory

Trust Zone Upgrade

In APs with Qualcomm Software Development Kit (QSDK) version 11.3, the trust zone collects CPU registers following a crash and saves them in memory for later retrieval during kernel crash dump process. To facilitate the kernel crash dump, the trust zone is updated automatically to the latest version for those APs that have the Kernel Minidump and Trustzone Upgrade feature enabled.

Note The trust zone upgrade is a one-time activity. Disabling the Kernel Minidump and Trustzone Upgrade feature or downgrading the controller software to a previous release from Cisco IOS XE 17.14.1 does not roll back the trust zone upgrade.

In Cisco IOS XE 17.14.1, the Kernel Minidump and Trustzone Upgrade feature is supported only on the following APs:

- Cisco Catalyst 9124 Series Access Points

- Cisco Catalyst 9136 Series Access Points

Configuring Minidump from Access Point (CLI)

Before you begin

- Ensure that clients are not connected to the AP.

- Keep the AP in standalone mode to prevent the AP from receiving conflicting payloads from the controller.

- Configuration pushed from the controller always overrides the value configured on the AP.

Procedure

	Command or Action	Purpose
Step 1	**configure boot minidump enable** **Example:** `Device# configure boot minidump enable`	Enables kernel coredump collection on the AP.

Configuring Minidump from Controller (CLI)

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 2	**ap profile** *profile-name* **Example:** `Device(config)# ap profile default-ap-profile`	Configures an AP profile and enters AP profile configuration mode.
Step 3	**core-dump kernel limit** *limit* **Example:** `Device(config-ap-profile)# core-dump kernel limit 4`	Configures the maximum number of kernel core dumps to be collected on an AP. Valid range is from 0 to 5.
Step 4	**core-dump kernel type mini-dump** **Example:** `Device(config-ap-profile)# core-dump kernel type mini-dump`	Configures the type of kernel core dump to be collected on the AP. Use the **core-dump kernel type disable** command to disable kernel core dump.

	Command or Action	Purpose
		Note Changing the core dump type from disabled to full-dump or mini-dump or vice versa will cause the APs to reboot. When you enable the full-dump option, the Kernel Minidump feature gets deactivated.
Step 5	**end** **Example:** `Device(config-ap-profile)# end`	Returns to global configuration mode.

Verifying Minidump Configuration

To view the mini-dump configuration on the controller, use the following command:

```
Device# show ap name AP3C57.31C5.99D0 config general  | sec Kernel core dump

Kernel core dump :
  Configured limit                          : 3
  Kernel core dumps collected on AP         : 1
  Kernel core dump type                     : Mini dump
```

To view the mini-dump configuration on the AP, use the following command:

```
AP# show boot

--- Boot Variable Table ---
BOOT path-list:     part1
Console Baudrate:   115200
Enable Break:       yes
Manual Boot:        yes
Memory Debug:       no
Crashkernel:        no
Minidump:           yes # Indicates Minidump is enabled.
SCRUB_LIMIT:        40 (default)
Kdump Limit:        5 # Configured limit. (this came from WLC via payload)
Kdump Collected:    0 # Number of times the feature ran after it was enabled.
Debug init:         0
```