

CC32xx Hibernate Application

Overview

User application can enter "Hibernate (HIB)" by calling the `PRCMHibernateEnter()` api. This api disables power to all modules except the HIB module and the clocks operates at 32KHz. The HIB module supports an RTC timer that can be enabled to be active and free running throughout the Active-HIB cycles once started. On entering HIB, the system can be woken up based on one of the following wakeup sources selected: • Wake Timer • GPIO In this mode, most of the system is shutdown (including network processors) and only the HIB module is active. The HIB module has 2 32-bit registers that can be used to save any information across HIB entry-exit cycles. The code execution commences from the reset vector.

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Application details

The objective of this application is to showcase the hibernate as a power saving tool in a networking context (in this case a UDP client). In this example the device wakes up periodically from hibernate and broadcasts a message and then enters hibernate again.

Source Files briefly explained

- **network_if** - Common functions to handle connection to AP and FreeRTOS hook functions.
- **main** - Core UDP broadcast implementation. On entry to main a check is done to check the wakeup cause (power on or HIB).
- **gpio_if** - Basic GPIO interface APIs.
- **pinmux** - Assigns a personality to the pins at the device boundary.
- **uart_if** - To display status information over the UART.
- **timer_if** - To handle timer for LED blinking.
- **startup_*** - Tool specific vector table implementation.

Usage

Note: It is recommended that the application be tested by flashing the .bin file onto the serial flash on LaunchPad only. The IAR and CCS debuggers will disconnect on entering low power modes and cannot be used for subsequent debug.

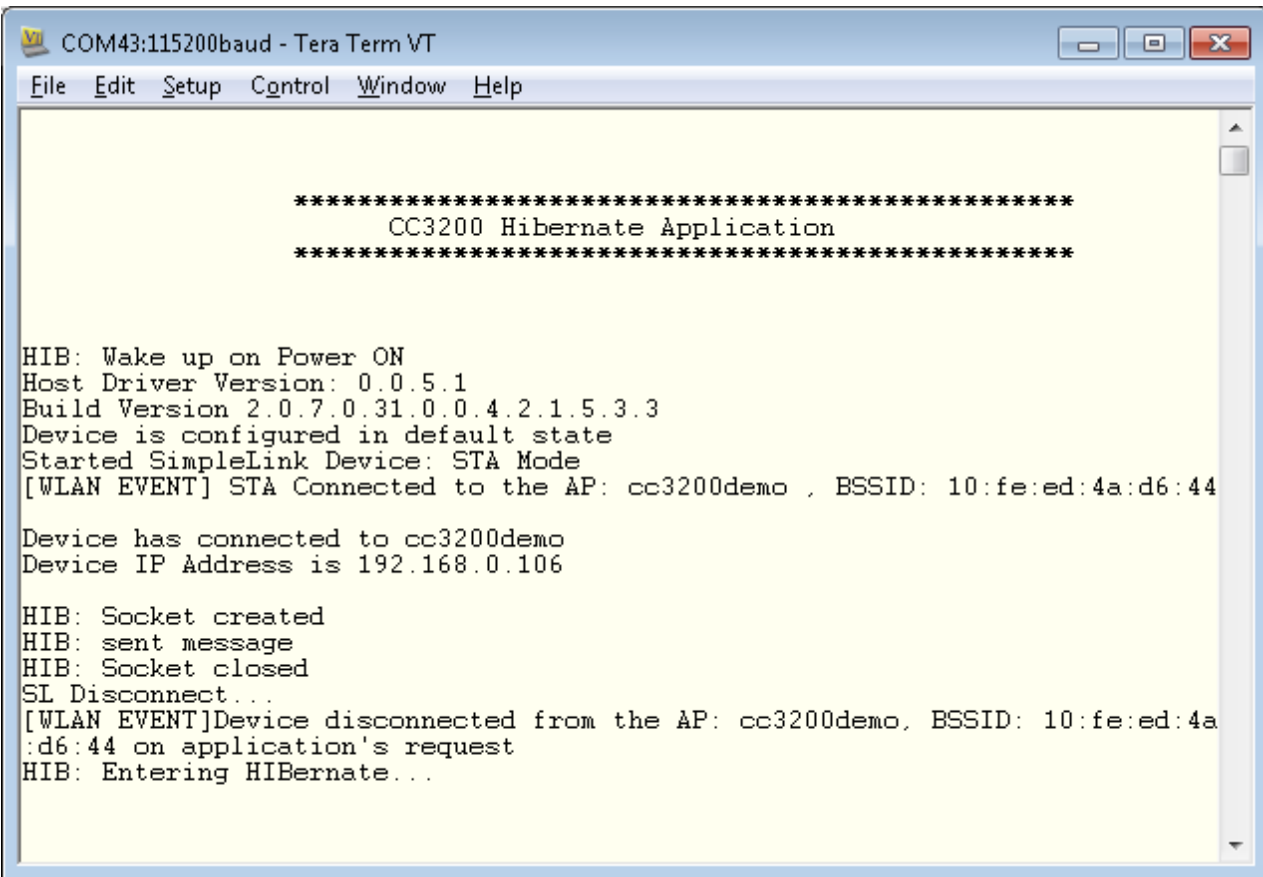
- Setup a serial communication application (HyperTerminal/TeraTerm). For detail info visit CC31xx & CC32xx Terminal Setting

On the host PC. The settings are:

- **Port:** Enumerated COM port
- **Baud rate:** 115200
- **Data:** 8 bit
- **Parity:** None
- **Stop:** 1 bit
- **Flow control:** None
- Run the reference application (Flashing the bin).

- If running from IDE then it'll disconnect from device while device goes to hibernate.
- Observe the status messages on the host over serial port to understand the sequence of operations performed by the application.
- The application tries to connect to AP by name DemoAP by default. In case this fails, the user is prompted to enter the AP name (Security type OPEN) to connect to on HyperTerminal/TeraTerm.
- An external application listening on UDP broadcasts will be able to receive the messages broadcast. The broadcast happens on port number 5001.

Terminal snapshot when application runs on device:



```
COM43:115200baud - Tera Term VT
File Edit Setup Control Window Help

*****
CC3200 Hibernate Application
*****

HIB: Wake up on Power ON
Host Driver Version: 0.0.5.1
Build Version 2.0.7.0.31.0.0.4.2.1.5.3.3
Device is configured in default state
Started SimpleLink Device: STA Mode
[WLAN EVENT] STA Connected to the AP: cc3200demo , BSSID: 10:fe:ed:4a:d6:44

Device has connected to cc3200demo
Device IP Address is 192.168.0.106

HIB: Socket created
HIB: sent message
HIB: Socket closed
SL Disconnect...
[WLAN EVENT]Device disconnected from the AP: cc3200demo, BSSID: 10:fe:ed:4a:d6:44 on application's request
HIB: Entering HIBernate...
```

Limitations/Known Issues

The HIBernation has a known issue. The chip resets after waking up from Hibernation when the Top die Flash is powered by internal DC-DC. A solution to this problem is to power the Top Die Flash from an external 3.3V supply.

Article Sources and Contributors

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