# Apple Homekey DEMO build instruction

1. Download NCS 2.4.1
2. Open command prompt for NCS 2.4.1, enter path like : C:\Work\ncs\v2.4.1>

## Download HomeKit code

3. west config manifest.group-filter +homekit
4. west list homekit
   Output : homekit homekit v2.4.1 https://github.com/nrfconnect/sdk-homekit
5. west update
6. Homekit directory should be there after completed.

## Download ST25r3916 lib code

7. Goto C:\Work\ncs\v2.4.1\nrf\lib
8. git clone -b homekey_release_st25r3916_2_4_0
   https://github.com/guangli2015/libst25r3916_ncs2.3.0.git
9. Change directory name from “libst25r3916_ncs2.3.0” to “st25r3916”
10. Add rsource "st25r3916/Kconfig" into C:\Work\ncs\v2.4.1\nrf\lib\ Kconfig
11. Add add_subdirectory_ifdef(CONFIG_ST25R3916_LIB st25r3916) into
    C:\Work\ncs\v2.4.1\nrf\lib\ CMakeLists.txt

## Download nfc_access_ncs2_4.patch for homekit & apply

12. Download nfc_access_ncs2_4.patch from
    https://github.com/guangli2015/nfcaccess_homkit24_ncs24.git
13. Copy nfc_access_ncs2_4.patch into C:\Work\ncs\v2.4.0\homekit
14. Apply the patch
15. Goto C:\Work\ncs\v2.4.1\homekit\tools\haptools to install haptools ( check the readme)
16. Goto C:\Work\ncs\v2.4.1\homekit\samples\lock

17. Build the sample
    West build -b nrf52840dk_nrf52840 -- -D DEBUG=y -D NFC=y
    West flash –recover

    Reference: ncs/v2.4.1/homekit/doc/html/samples/samples_building.html

18. Provisioning
    Reference: ncs/v2.4.1/homekit/doc/html/samples/samples_provisioning.html

    You can only use one of the supported provisioning methods. According to HAP specification, NFC and QR codes cannot work simultaneously. (When provisioning for a multiprotocol application, the --ble flag is required because initial commissioning is always made from Bluetooth)
    a. Provisioning with QRcode
    haptools provision ncs ble -c 6 -p 0x1122334455667788 -q qrcode --device NRF52840

b. Provisioning with NFC
1. generate the info.hex
2. haptools provision ncs {thread --ble | ble [--device <DEVICE>]} --nfc -c <category> -p <product data> [-s <xxx-xx-xxx>] [--eui <custom_EUI>] [--snr <jlink_id>] [-u <mfi token uuid>] [-m <mfi token>]
haptools provision ncs ble --nfc -c 5 -p 03d8a775e3644573 --device NRF52840
nrfjprog -f nrf52 --sectorerase --program _generated/<provisioned_setup_info_name>.hex --reset

## Usage of DEMO

1. Goto Iphone home app
2. Add or scan accessory

## Hardware

52840DK with st25r3916 as NFC reader


## Sw architecture

There are 2 parts of sw :

1. st25r2916 drv lib in C:\Work\ncs\v2.4.1\nrf\lib\st25r3916
C:\Work\ncs\v2.4.1\nrf\lib\st25r3916\source\ demo_polling.c is the implementation of the NFC polling loop

2. app code in C:\Work\ncs\v2.4.1\homekit\samples\lock\src

tag_reader.c  run the entire NFC process as a thread , do the hardware init  and flash init ( use spi_flash in 52840DK as storage ),then run the NFC polling loop , run the ISR handler as another thread

uaap_cmds.c implement the unified access air protocol expedited standard transaction ,used by C:\Work\ncs\v2.4.1\nrf\lib\st25r3916\source\ demo_polling.c

## How to do sw change in order to replace st25r3916 into other NFC chip?

1. Add chip drv lib into C:\Work\ncs\v2.4.1\nrf\lib
2. Add chip hardware init & NFC polling loop func into tag_reader in  tag_reader.c
3. Handle ISR properly in tag_reader.c or in the drv lib
4. Implement NFC send/recv func demoTransceiveBlocking in uaap_cmds.c
5. Add Make_ECPVASUP_cmd & uaap_expedited_standard_transaction (uaap_cmds.c) into your NFC polling loop.