In c ion fo Se ing

Google Clo d IoT fo he All inne R

de elo e Ki

A   B   PD

J

Ve ion	Im lemen ed B	Re i ion Da e	Re i ed B	Re i ion Da e	No e
					P F P DK
	J C				

C

D

A C L A

A A G

C I A G
G A I G

A

C

Definitions

GPIO DRAM

PM DK A D

AP B F B P

L F M

Prerequisites

P
O D L DK D C
O D A F P
C
D G C I PC D C I A
G
C G C I C P
D C I A G

Create project

wangxiao@allwinnertech.com created allwinner-164401
April 12, 2017 at 9:27:52 AM UTC+8

User	wangxiao@allwinnertech.com
Resource name	projects/allwinner-164401
Request	
Project	
Create time	2017-04-12T01:27:45.209Z
Lifecycle state	ACTIVE
Name	Allwinner
Project id	allwinner-164401
Project number	280303967737

F P G C P

E

API	Requests	Errors	Error ratio	Latency, median	Latency, 98%	
BigQuery API	—	—	—	—	—	Disable
Google Cloud APIs	—	—	—	—	—	Disable
Google Cloud Datastore API	—	—	—	—	—	Disable
Google Cloud IoT API Private API	—	—	—	—	—	Disable
Google Cloud Pub/Sub API	—	—	—	—	—	Disable
Google Cloud SQL	—	—	—	—	—	Disable
Google Cloud Storage	—	—	—	—	—	Disable
Google Cloud Storage JSON API	—	—	—	—	—	Disable
Google Service Management API	—	—	—	—	—	Disable
Stackdriver Debugger API	—	—	—	—	—	Disable

F   E   API

IAM   D   C   I   A   G

Set IAM policy on project

wangxiao@allwinnertech.com has set the project's IAM policy
April 19, 2017 at 6:40:54 PM UTC+8

User	wangxiao@allwinnertech.com
Resource name	projects/allwinner-164401
Added pubsub.publisher	servi... loud...@system...account.com

F   IAM

C   D   C   I   A   G

Create device registry

wangxiao@allwinnertech.com created my-registry-id
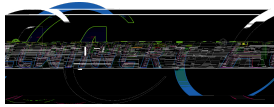April 19, 2017 at 6:56:30 PM UTC+8

User	wangxiao@allwinnertech.com
Resource name	projects/allwinner-164401/locations/us-central1/registries/my-registry-id
Request	
Device registry	
Default monitoring config	MONITORING_ENABLED
Id	my-registry-id
Parent	projects/allwinner-164401/locations/us-central1
Response	
Default monitoring config	MONITORING_ENABLED
Id	my-registry-id
Name	projects/allwinner-164401/locations/us-central1/registries/my-registry-id

F   C

C   D   C   I   A   G

O   C   I   A   G

B   G   C   I   I   C   I   A   G

Google Cloud Platform

1 Download Tina Linux from GitHub or FTP server

L   R   G H   A
I

```
$ curl https://raw.githubusercontent.com/tinalinux/repo/stable/repo > ~/bin/repo
$ chmod +x ~ /bin/repo
$ export PATH=$PATH:~/bin/
$ mkdir tina && cd tina
$ repo init - u https://github.com/tinalinux/manifest -b r18-v0.9 -m r18/v0.9.xml
$ repo sync
$ repo start r18-v0.9 --all
```

F   C   L
F   C   DK   C DN

```
$ curl https://code.csdn.net/tinalinux/repo/blob/stable/repo > ~/bin/repo
$ chmod +x ~ /bin/repo
$ export PATH=$PATH:~/bin/
$ mkdir tina && cd tina
$ repo init - u https://code.csdn.net/tinalinux/manifest.git -b r18-v0.9 -m r18/v0.9-csdn.xml
$ repo sync
$ repo start r18-v0.9 --all
```

F   D   L   C DN   C

2 Necessary modules needed by Google Cloud IoT demo on Tina SDK

P   L
O   L   DK
M

DK   L   O

```
You're building on Linux

Lunch menu... pick a combo:
     1. octopus_dev-tina
     2. octopus_dev-dragonboard
     3. tulip_m64-tina
        4. tulip_m64-dragonboard
        5. astar_evb-tina
        6. tulip_pine64-tina
        7. tulip_pine64-dragonboard
        8. octopus_sch-tina
        9. octopus_sch-dragonb
```

F

N   I   P

P

L   P

M

P

G   C   I

```
.config - Tina Configuration
> Languages > Python
                              Python
  Arrow keys navigate the menu.  <Enter> selects submenus ---> (or empty submenus ----).  Highlighted letters are hotkeys.  Pressing
  <Y> includes, <N> excludes, <M> modularizes features.  Press <Esc><Esc> to exit, </> for Help,
       [ ] excluded  <M> module  < > module capable

             < > mic
               -*-  ython................................................. Python 2.7 programming language
               <*>  ython-attrs............................................................. python-attrs
               -*-  ython-base.......................................... Python 2.7 interpreter
               -*-  ython-cffi.......................................... p
```
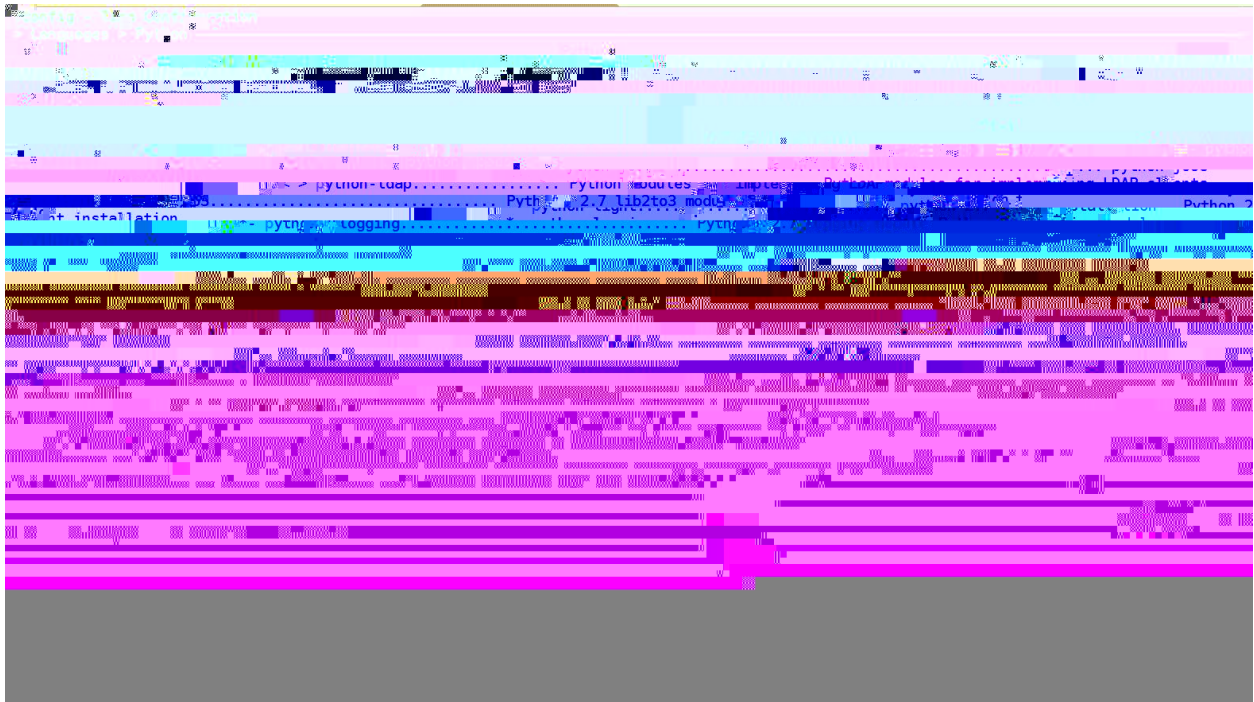
F   N   P

```
.config - Linux/arm64 3.10.65 Kernel Configuration
 > Device Drivers > Network device support > Wireless LAN
 ┌─────────────────────────── Wireless LAN ───────────────────────────┐
 │  Arrow keys navigate the menu.  <Enter> selects submenus --->.  Highlighted letters are hotke │
 │                                                                                               │
 │          < >   Wireless RNDIS USB support                                                     │
 │          [ ]   Enable WiFi control function abstraction                                       │
 │          < >   Atheros Wireless Cards  --->                                                   │
 │          < >   Broadcom FullMAC wireless cards support                                        │
 │          < >   Broadcom IEEE802.11n embedded FullMAC WLAN driver                              │
 │          < >   IEEE 802.11 for Host AP (Prism2/2.5/3 and WEP/TKIP/CCMP)                       │
 │          < >   Marvell 8xxx Libertas WLAN driver support                                      │
 │          [ ]   TI Wireless LAN support  --->                                                  │
 │          < >   Marvell WiFi-Ex Driver                                                         │
 │          < >   Realtek 8188E USB WiFi                                                         │
 │         <M>    Realtek 8723B SDIO or SPI WiFi                                                 │
 │          < >   XRadio WLAN support  --->                                                      │
 │                                                                                               │
 │                                                                                               │
 │            <Select>    < Exit >    < Help >    < Save >    < Load >                           │
 └───────────────────────────────────────────────────────────────────────────────────────────┘
```
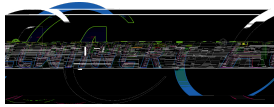
```
.config - Tina Configuration
 > Kernel modules > Wireless Drivers
                              Wireless Drivers
   Arrow keys navigate the menu.  <Enter> selects submenus ---> (or empty submenu ----).  Highlighted letters are hotkeys.  Pressing
```

F

F   F   F

.config - Tina Configuration
> Allwinner > wifimanager..Tina wifi manager

<press>Esc><Esc> to s..y

--- wifimanager   Tina wifi manager

<Select>   < Exit >   < Help >   < Save >   < Load >

```
.config - Linux/arm64 3.10.65 Kernel Configuration
> Device Drivers > Network device support > Wireless LAN
                                           Wireless LAN
    Arrow keys navigate the menu.  <Enter> selects submenus --->.  Highlighted letters are hotkeys.  Pressing <Y> includes, <N> excludes,
    <M> modularizes features.  Press <Esc><Esc> to exit, <?> for Help, </> for Search.  Legend: [*] built-in  [ ] excluded  <M> module
    < > module capable

                        --- Wireless LAN
                        < >   USB ZD1201 based Wireless device support
                        < >   Wireless RNDIS USB support
                        [ ]   Enable WiFi control function abstraction
                        < >   Atheros Wireless Cards  --->
                        < >   Broadcom FullMAC Wireless cards support
                        (/lib/firmware/fw_bcmdhd.bin) Firmware path (NEW)
                        (/lib/firmware/nvram.txt) NVRAM path (NEW)
                              Enable Chip Interface (SDIO bus interface support)  --->
```

F   C   I B   I

F   K

P   AP

AP

```
.config - Tina Configuration
> Firmware
                                    Firmware
  Arrow keys navigate the menu.  <Enter> selects submenus ---> (or empty submenus ----).  Highlighted letters are hotkeys.  Pressing
  <Y> includes, <N> excludes, <M> modularizes features.  Press <Esc><Esc> to exit, <?> for Help, </> for Search.  Legend: [*] built-in
```

F

3 Compile the Tina Linux and flash the firmware on board

N   G   C   I
          O

O


```
make[2]: Leaving directory `/home/wangxiao/workspace/tina_2.0'
make[1]: Leaving directory `/home/wangxiao/workspace/tina_2.0'

#### make completed successfully (44 seconds) ####
```

F
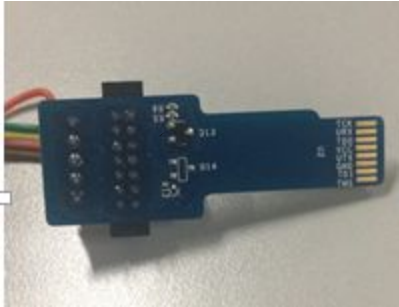
F   A   F

F

```
/home/wangxiao/workspace/tina_2.0/out/tulip-d1/tina_tulip-d1_card0.img

pack finish
```

F

P

M

4 Run Google Cloud IoT Demo on Tina

A   O   P   C   I

```
BusyBox v1.24.1 () built-in shell (ash)

[    8.110129] CPU1: shutdown
[    8.113114] psci: CPU1 killed.

          Tina is Based on OpenWrt!
------------------------------------------------
 Tina Linux (Neptune, 587479EB)
------------------------------------------------
root@TinaLinux:/#
root@TinaLinux:/#
root@TinaLinux:/#
root@TinaLinux:/#
root@TinaLinux:/#
root@TinaLinux:/# echo 4 > /proc/sys/kernel/printk
printk                    printk_ratelimit
printk_delay              printk_ratelimit_burst
root@TinaLinux:/# echo 4 > /proc/sys/kernel/printk
root@TinaLinux:/# python
Python 2.7.11 (default, Apr 17 2017, 07:00:02)
[GCC 5.2.1] on linux2
Type "help", "copyright", "credits" or "license" for more information.
>>> 
```

F   P

C   I   N   ID PA   ORD
F   ID   P

```
root@TinaLinux:/# wifi_connect_ap_test "SSID" "PASSWORD"

************************************
***Start wifi connect ap test!***
************************************
wpa_suppplicant not running!
ctrl_interface != /etc/wifi/sockets
```

                    F   C   I

F

O

A A

I

adb h a i a e em

adb h oo em

E

Re lace he he line im o j i h f om jo e im o j

 G C I

F

```
root@TinaLinux:/# python google.py --project_id=allwinner-164401 --registry_id=
    --registry-id --device-id=my-rs256-device-id --private_key_file=/usr/rsa_privat
e.em --algorithm=RS256
Creating JWT using RS256 from private key file /usr/rsa_private.em
Publishing message 1/100: 'my-registry-id/my-rs256-device-id-payload-1'
on_connect 0: No error.
Publishing message 2/100: 'my-registry-id/my-rs256-device-id-payload-2'
on_publish
on_publish
Publishing message 3/100: 'my-registry-id/my-rs256-device-id-payload-3'
on_publish
Publishing message 4/100: 'my-registry-id/my-rs256-device-id-payload-4'
on_publish
Publishing message 5/100: 'my-registry-id/my-rs256-device-id-payload-5'
on_publish
Publishing message 6/100: 'my-registry-id/my-rs256-device-id-payload-6'
on_publish
Publishing message 7/100: 'my-registry-id/my-rs256-device-id-payload-7'
on_publish
Publishing message 8/100: 'my-registry-id/my-rs256-device-id-payload-8'
on_publish
Publishing message 9/100: 'my-registry-id/my-rs256-device-id-payload-
```

F   D

```
Publishing message 72/100: 'my-registry-id/my-rs256-device-id-payload-72'
on_publish
Publishing message 73/100: 'my-registry-id/my-rs256-device-id-payload-73'
on_publish
Publishing message 74/100: 'my-registry-id/my-rs256-device-id-payload-74'
on_publish
     g message 75/100: 'my-registry-id/my-rs256-device-id-payload-75'
n_publish
ublishing message 76/100: 'my-registry-id/my-rs256-device-id-payload-76'
n_publish
ublishing message 77/100: 'my-registry-id/my-rs256-device-id-payload-77'
n_publish
ublishing message 78/100: 'my-registry-id/my-rs256-device-id-payload-78'
n_publish
   message 79/100: 'my-registry-id/my-rs256-device-id-payload-79'
   message 80/100: 'my-registry-id/my-rs256-device-id-payload-80'
   message 81
```

F   D   L

O   MQ

P

```
[Secret-Ca■■le:~ Wang$ gcloud █░░ ░ pu ░    subscriptions pull --auto-ack pro
ects/   allwinner-164401/subscriptions/my-subscription

            DATA                          MESSAGE ID
                                             ATTRIBUTES



egistry-id/my-rs256-device-id-payload-66 | 1210171445547░░ ░░ et░░░░░ , s256=░
evice-id deviceNumId=2647740481950093 deviceRegistryId░░░my-registry-id devi  ceR
gistryLocation=us-central1 projectId=allwinner-164401 subFolder= |



istle:~ Wang$ ||
```

F

ᴿ

roots.pem   PhoenixSuit Use