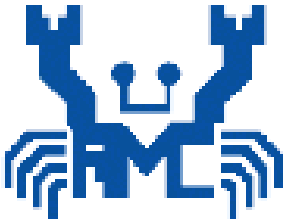

Realtek Elink

User Guide

May 8 2018, Version 3.0-V5

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1.1 Configure Kernel

Machine selection --->

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(*) Enable Flash Dual Bank support

**** Second Bank Offset ****

(0x400000) offset of Flash //offset is decided by the real sizeof image

(0x400000) Size of Flash //should be the same with the offset above

(0x100000) elinksdk partition size in flash. //elinksdk parttion size

Device Drivers --->

Network device support --->

Wireless LAN --->

(*) Record client host support

(*) RTK Smart Roaming Support

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1.2 Configure User

(*) adapter api

(*) basic adapter api (for multi-wan)

(*) openssl

openssl(openssl-1.0.2d)

(*) elink_support

(*) elinksdk

(*) elinksdk in romfs //Optional

1.3 Configure busybox

Archival Utilities --->

(*) tar

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1.4 Configure BootCode

Target Platform Selection ---->

(*) Support Flash DualBank

(Toggle) Mode

(400000) Second Bank offset //keep the same size with the offset in 1.1

2. Related Mibs

Name	Meaning	Value	Default	Comment
MIB_RTL_LINK_ENABLE	Activate/Deactivate Elink when DUT is up	0 – activate, 1 - deactivate	0	
MIB_RTL_LINK_SYNC	control whether sync wifi setting or not	0 - not sync wifi setting 1 – sync wifi setting	1	
MIB_RTL_LINK_VENDOR	Vendor info	"string value", <=32 bytes	0	Customization. Used by register interface
MIB_RTL_LINK_DEVMODEL	Device model info	"string value", <=32 bytes	0	Customization. Used by register interface
MIB_RTL_LINK_SWVERSION	Software version	"string value", <=32 bytes	0	Customization. Used by register interface
MIB_RTL_LINK_HWVERSION	Hardware version	"string value", <=32 bytes	0	Customization. Used by register interface
MIB_RTL_LINK_URL	URL address	"string value", <=32 bytes	0	Customization. Used by register interface
MIB_RTL_LINK_WIRELESS	Support wireless or not	0 – not support, 1 – support	0	Customization. Used by register interface
MIB_CUSTOMER_HW_ELINK_SERIAL_NUM	Serial num	"string value" 22 bytes	0	Fixed part of sn Used by register interface
MIB_RTL_LINK_EXTEND_OF_SN	Extra serial num	"string value" <= 94 bytes	0	Customized part of sn Used by register interface

Table 1

The information of customized Mibs in Table1 will be sent to Elink-server by dev_reg interface. For example:

flash set RTL_LINK_VENDOR "realtek"

flash set RTL_LINK_ DEVMODEL "ELINK_AP"

flash set RTL_LINK_SWVERSION “SDK3.4.11C”

flash set RTL_LINK_HWVERSION “RTL8197F”

flash set RTL_LINK_URL “www. realsil.com.cn”

flash set RTL_LINK_WIRELESS 1

*flash set CUSTOMER_HW_ELINK_SERIAL_NUM 123456789012345678901*2

flash set RTL_LINK_EXTEND_OF_SN ABCDEF

Then the dev_reg packet will be as follow:


```
{
    "type": "dev_reg",
    "sequence":    3,
    "mac": "00E04C8196D1",
    "data":{
            "vendor":       "realtek",
            "model":        "ELINK_AP",
            "swversion":    "SDK3.4.11C",
            "hdversion":    "RTL8197F",
            “sn”:   “12345678901234567890200E04C8196D1ABCDEF”
            "url":   "www.realsil.com.cn",
            "wireless":     "yes"
    }
}
```


Note:

The “sn” is CUSTOMER_HW_ELINK_SERIAL_NUM + MAC + RTL_LINK_EXTEND_OF_SN

3. How to Enable/Disable Elink

By flash instructions:

To enable Elink:

flash set RTL_LINK_ENALBE 1

reboot or run command "elink –m1 –d2" to enable Elink

To disable Elink:

flash set RTL_LINK_ENABLE 0

reboot to take effect

To enable Elink sync configuration feature:

flash set RTL_LINK_SYNC 1

To disable Elink sync configuration feature:

flash set RTL_LINK_SYNC 0

To enable DualFirmware

flash set MIB_DUALBANK_ENABLED 1

By Web UI:

Enable Elink through Web UI:

MANAGEMENT->DEVICE MANAGEMENT->ELINK CONFIGURATION

See Fig1 below.

Fig 1

Enable DualFirmware through Web UI:

MANAGEMENT-> DEVICE MANAGEMENT->UPGRADE FIRMWARE

See Fig2 below.

Fig 2

4. Feature Test

Suppose DUT's operation mode is Gateway-Mode and its LAN PORTS' DHCP mode is DHCP-Server by default.

a) *Connect DUT and Remote-Gateway by wired or wireless.*
   By wired for example: Connect DUT's WAN port to Remote-Gateway's LAN port through ethernet cable directly
b) *Enable DUT's Elink, and Remote-Gateway will send its WiFi configuration automatically.*
c) *Check whether DUT synchronize its WiFi settings with Remote-Gateway.*
d) *Check whether DUT change its operation mode to Bridge-Mode.*
e) *Check whether DUT change its LAN PORTS' DHCP mode to DHCP-Client.*
f) *Change Remote-Gateway's WiFi configuration.*
g) *Check whether DUT update its WiFi settings with the latest change of Remote-Gateway.*
h) *Test other interfaces use 天翼 app, check whether the response of DUT is correct.*

5. Elink Cloud SDK

5.1 How to implement Elink Cloud SDK

1) *Change the name of Elink Cloud SDK to **elink_sdk**, and **put it under users/elink_cloud***
2) *Configure the SDK as described in chapter 1, and rebuild*
3) *Elinksdk plugin file will be generated in the dir - users/elink_cloud/plugin/, included: plugin.tar, elinksdk, plugin.txt, elinksdk_md5*

5.2 The structure of Elinksdk plugin file

The structure of Elinksdk plugin file is as follows:

- *plugin.tar: elinksdk plugin archive file,*
  the compressed files of elinksdk , elinksdk_md5 and plugin.txt.
- *elinksdk: elinksdk binary file*
- *elinksdk_md5: md5 of binary file elinks*dk
- *plugin.txt: param about plugin.tar(**fixed name**)*

In our rtl8197f platform, the params in plugin.txt are as follows:

NAME:elinksdk

MD5_NAME:elinksdk_md5

VERSION:1.0.0.0

VENDOR:realtek

ARCH:RTL8197F

- *NAME: elinksdk binary file name*
- *MD5_NAME: elinksdk binary md5 file name*

  Info in elinksdk_md5 as follows

  e7733f7638c6ebd545f7fffe3a1fbe0a elink_sdk/build/elinksdk

  "e7733f7638c6ebd545f7fffe3a1fbe0a" is md5 of elinksdk binary file
- *VENDOR: vendor info*
- *VERSION: elinksdk version, when elink receive elinksdk plugin download command and*

elinksdk plugin in DUT is not the newest one, we will download elinksdk plugin from remote server.

The vesion structure is as follows

V1:V2:V3:V4

V1: main version, significant modifications in elinksdk will increase this version

V2: minor version, considerable modification in elinksdk will increase this version

V3: released version, be to zero if main version or minor version modified.

V4: compile version

- *ARCH: platform elinksdk runs on*

  Get the ARCH info from /proc/cpuinfo in DUT, in 97f platform, the ARCH is RTL8197F

  # cat /proc/cpuinfo

  system type : RTL8197F

  machine : Unknown

  processor : 0

  cpu model : MIPS 24Kc V8.5

  BogoMIPS : 666.41

  .
  .
  .

Note:

The values above can be changed in users/elink_cloud/Makefile, see Fig3 below:

```
NAME=elinksdk
MD5_NAME=elinksdk_md5
VERSION=1.0.0.0
VENDOR_NAME=realtek
ARCH=RTL8197F
ifeq ($(CONFIG_RTL_8197F),y)
ARCH=RTL8197F
endif
```

Fig 3

5.3 How to test Elink Cloud SDK

5.3.1 Download elinksdk from ROMFS:

Elinksdk in romfs is optional, enable this feature in users_menuconfig, Elinksdk(included in plugin.tar) will be pre-installed in ROMFS(/etc/plugin.tar).

- *Set RTL_LINK_ENABLE to 0:*

  flash set RTL_LINK_ENABLE 0

- *Empty var/elinksdk:*

  *rm –rf var/elinksdk/**

- *Reboot DUT, execute "cat proc/mtd" to check whether elinksdk partition is mounted*

```
# cat proc/mtd
dev:    size   erasesize  name
mtd0: 00260000 00010000 "boot+cfg+linux"
mtd1: 004c0000 00010000 "rootfs"
mtd2: 00060000 00010000 "jffs2 file"
mtd3: 00080000 00010000 "elinksdk"
```

- *Execute "ls etc/plugin.tar" to check whether it exists*
- *Execute "ls var/elinksdk" to check whether elinksdk is installed to elinksdk partition*

```
# ls var/elinksdk
elinksdk      elinksdk_md5  plugin.txt
```

- *Execute "ps" to check whether elinksdk is running*

```
1126 root     11328 S    /bin/cwmpClient
1160 root         0 SWN  [jffs2_gcd_mtd3]
1177 root      2672 S    /var/elinksdk/elinksdk
1204 root      2400 S    boa
1206 root      1152 S    -/bin/sh
```

- *Run command "elink –m1 –d2" to check whether elink runs correctly with both GW and elinksdk*

5.3.2 Download elinksdk from Internal Server:

Disable "elinksdk in romfs" feature in users_menuconfig. The DUT will download Elinksdk automatically from Internal Server, when the WAN port connected to internet.

- *Set the URL of Elinksdk in your Internal Server to MIB_ELINKSDK_DOWNLOAD_URL*

  For example:

  flash set ELINKSDK_DOWNLOAD_URL http://192.168.1.187:8080/plugin.tar

- *Set RTL_LINK_ENABLE to 0:*

  flash set RTL_LINK_ENABLE 0

- *Empty var/elinksdk:*

  *rm –rf var/elinksdk/**

- *Reboot DUT, execute "cat proc/mtd" to verify whether elinksdk partition is mounted*

```
# cat proc/mtd
dev:    size   erasesize  name
mtd0: 00260000 00010000 "boot+cfg+linux"
mtd1: 004c0000 00010000 "rootfs"
mtd2: 00060000 00010000 "jffs2 file"
mtd3: 00080000 00010000 "elinksdk"
```

- *Configure wan port settings to connect Internet, and make sure the URL is available*
- *Execute "ls var/elinksdk" to check whether elinksdk is downloaded and installed to elinksdk partition*

```
# ls var/elinksdk
elinksdk      elinksdk_md5  plugin.txt
```

- *Execute "ps" to check whether elinksdk is running*

```
1126 root     11328 S    /bin/cwmpClient
1160 root         0 SWN  [jffs2_gcd_mtd3]
1177 root      2672 S    /var/elinksdk/elinksdk
1204 root      2400 S    boa
1206 root      1152 S    -/bin/sh
```

- *Run command "elink –m1 –d2" to check whether elink runs correctly with both GW and elinksdk*

5.3.3 Download elinksdk from Webpage:

When Elinksdk support is enabled, "elink cloud sdk upgrade" form will be shown on the webpage: MANAGEMENT->DEVICE MANAGEMENT->ELINK CONFIGURATION, See Fig 4 below. The plugin.tar (including elinksdk elinksdk_md5 and plugin.txt, generated in users/elink_cloud/plugin) can be installed through this page.

Note:

The format of the file to be uploaded must be .tar

The size of the file to be uploaded must be less than 512K

Fig 4

The information of the uploading results will be prompt as follows:

- ***Install Elink cloud SDK failed: MD5 error!***

  --- When the md5 checksum of elinksdk mismatched the value in elinksdk_md5

- ***Install Elink cloud SDK failed: Arch error!***

  --- When the arch info in plugin.txt is not the same with the DUT's arch

- ***Install Elink cloud SDK failed: Already the newest!***

  --- When the version is lower than or equal to the current version

- ***Elink cloud SDK Upgrade successfully!***

  --- Upgrade successfully, and the new version info will be shown on this page

5.3.4 Download elinksdk from Elink-interface(组网终端远程管理插件消息):

- *Modify the VERSION param in users/elink_cloud/Makefile, prepare two versions of plugin.tar, for example, the older version 1.0.0.0, the newer version 2.0.0.0, install the older version of plugin.tar to ROMFS.*
- *Set RTL_LINK_ENABLE to 1, Empty var/elinksdk and reboot DUT*
- *When DUT bootup, it will download the older version of elinksdk from ROMFS automatically, then execute "cat var/elinksdk/plugin.txt", check whether the version info is as below：*

```
# cat var/elinksdk/plugin.txt
NAME:elinksdk
MD5_NAME:elinksdk_md5
VENDOR:realtek
VERSION:1.0.0.0
ARCH:RTL8197F
```

- *Control GW(elink server) to issue "upgrade_clinet" command.*

  The downurl item should be the url of the newer version plugin.tar

  The checksum item should be the md5 checksum of newer version plugin.tar

  Set isreboot item to 1(not reboot directly)
- *Make the checksum correct, check whether it will stop elinksdk, download and decompress the newer version of plugin.tar correctly.*
- *Execute "cat var/elinksdk/plugin.txt", check whether the elinksdk is upgraded:*

```
# cat var/elinksdk/plugin.txt
NAME:elinksdk
MD5_NAME:elinksdk_md5
VENDOR:realtek
VERSION:2.0.0.0
ARCH:RTL8197F
```

- *Execute "ps" Check whether the newer Elinksdk is running correctly*
- *Execute "rm -rf var/elinksdk/*", delete the newer version of Elinksdk in elink partition*

- *Reboot DUT, the older version of elinksdk in ROMFS will be re-installed in elink partition*

  Execute "cat var/elinksdk/plugin.txt" to verify:

```
# cat var/elinksdk/plugin.txt
NAME:elinksdk
MD5_NAME:elinksdk_md5
VENDOR:realtek
VERSION:1.0.0.0
ARCH:RTL8197F
```

- *Control GW to issue "upgrade_client" command again, but make the checksum wrong*
- *Check whether it will stop elinksdk, but download fail, and restart the older version of Elinksdk*
- *Set isreboot item of "upgrade_client" command to 0(reboot directly), Make the checksum correct, check whether the DUT will reboot, and the version of Elinksdk will be upgraded*