Ameba airkiss User Guide

This document describes how airkiss works and how to use airkiss code for Ameba.

Table of Contents

1 Introduction 3
2 Airkiss on Ameba 3
3 How to apply airkiss patch to Ameba 6

1 Introduction

Airkiss is a technology provided by wechat, it aims at make it easier to let IOT devices connect to WiFi hotspot via wechat.

Airkiss technology can be applied to these situations:

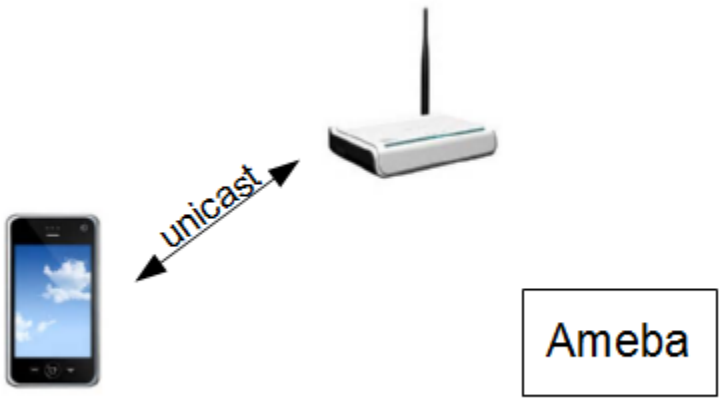
1. Devices that have no input/output capabilities, such as air conditioner, smoke alarm.
2. Users do not have enough IT knowledge to configure devices by themselves.

Refer to http://iot.weixin.qq.com/ for more information.

2 Airkiss on Ameba

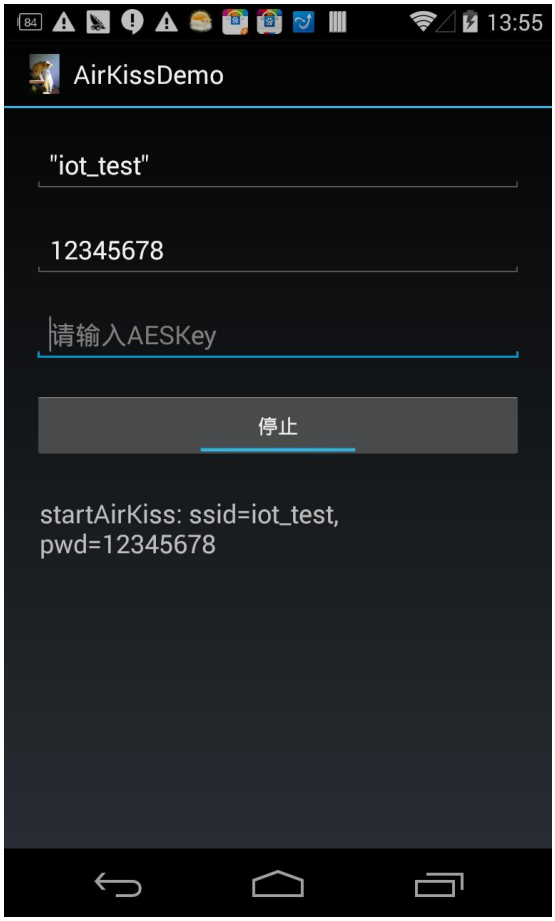
Tencent provides airkiss library and interfaces to public, Ameba employs this library and makes it work. There is some basic knowledge about how airkiss works.

1. Firstly, user must have application installed on smart phone, which has airkiss function.
2. This phone must connect to some WiFi hotspot, for example, it connects to some AP whose SSID is 'iot_test', password is '12345678'. At this time, mobile phone communicates to AP with unicast packets.



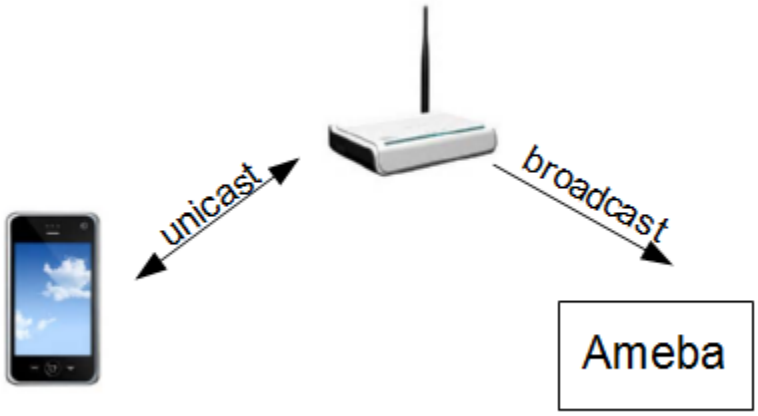
3. User inputs WiFi password, then clicks the buttons, which will initiate airkiss process.

There are two screenshots of airkiss demo application on Android.



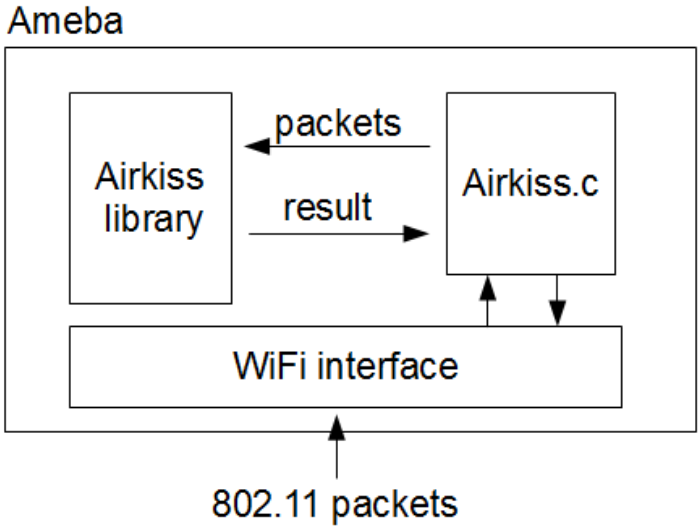
If you want to develop applications based on airkiss, you must apply for an wechat account and submit request to tencent, refer to http://iot.weixin.qq.com/document-0_1_1.html for details.

4. Mobile phone will send broadcast packets to AP and AP will forward these packets to the air. Unicast packets sent by mobile phone is encrypted by unicast key, broadcast packets forwarded by AP is encrypted by group key.

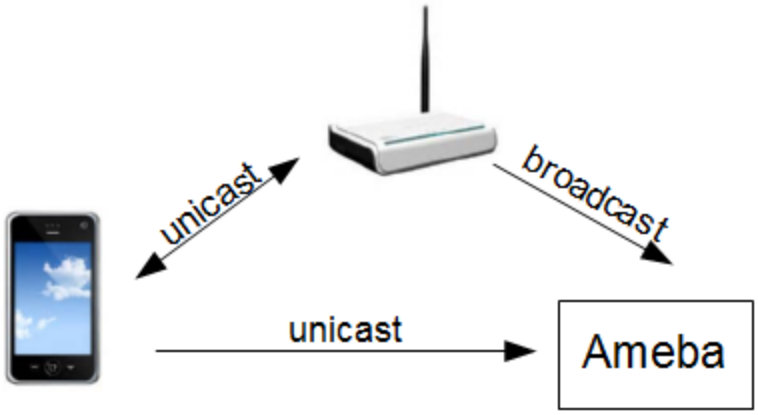


So how can devices decrypt these packets without key? The key point is, devices do not decrypt these packets, devices only need to get these encrypt packets and pass them to airkiss library to get information needed. The details of how to call airkiss library API are both described in wechat website and airkiss.c provided by Realtek.

5. User need to type 'ATWX' in serial terminal of Ameba to turn it into airkiss mode.
Ameba will enter promiscuous mode and start to switch channel to get packets in the air. Airkiss library will provide information of which channel has airkiss packets and provide SSID and password of AP at last.



6. Some AP forwards only part of broadcast packets and some AP even does not forward broadcast packets, so airkiss 2.0 introduces new mechanism to receive mobile phone's unicast packets directly. Experiments show there are more unicast packets received than broadcast packets. Because unicast packets have much higher data rate than broadcast packets and there are many retry packets, which accelerates the airkiss configure process.

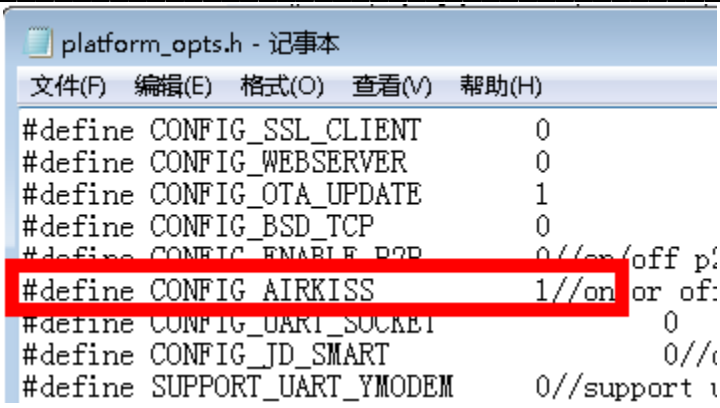


7. After Ameba gets SSID and password, it starts to connect to AP and finally gets IP address.

3 How to apply airkiss patch to Ameba

1. You will get airkiss patch file, such as ameba_airkiss_2.0.zip
2. Extract it and place it to somewhere of SDK, such as component\common\application\airkiss
3. Open SDK by IAR, and add airkiss.c and libairkiss.a to project.

4. In order to use 'ATWX' to start airkiss process, you need to change platform_opts.h, Set CONFIG_AIRKISS to 1.



5. Build SDK and download to Ameba, reset Ameba and type 'ATWX' in terminal, you will see airkiss config process successfully get started:

```
#ATWX


Airkiss version airkiss-2.0.0-23930(Aug 10 2015 15:26:31);iccarm/V7.40.2.8542/W32;ARM
Cortex-M3
ioctl[SIOCGIWESSID] ssid = NULL, not connected
[MEM] After do cmd, available heap 38408


#

 wifi switch channel to 2
#

 wifi switch channel to 3

 wifi switch channel to 4

 wifi switch channel to 5

 wifi switch channel to 6
```

6. Don't forget to input SSID and password in mobile phone and start sending airkiss packets.