Configure WiFi with Bluetooth

V 1.1

2018/10/23

修订历史（Revision History）

日期	版本	修改	作者	Reviewer
2018/03/28	V 1.1	初始化文档	Thomas_li	Alex_lu
2018/10/10	V 1.2	完善 Command/Event	Alex Lu	

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1 Introduction

配置 WLAN 的框架结构图如下：

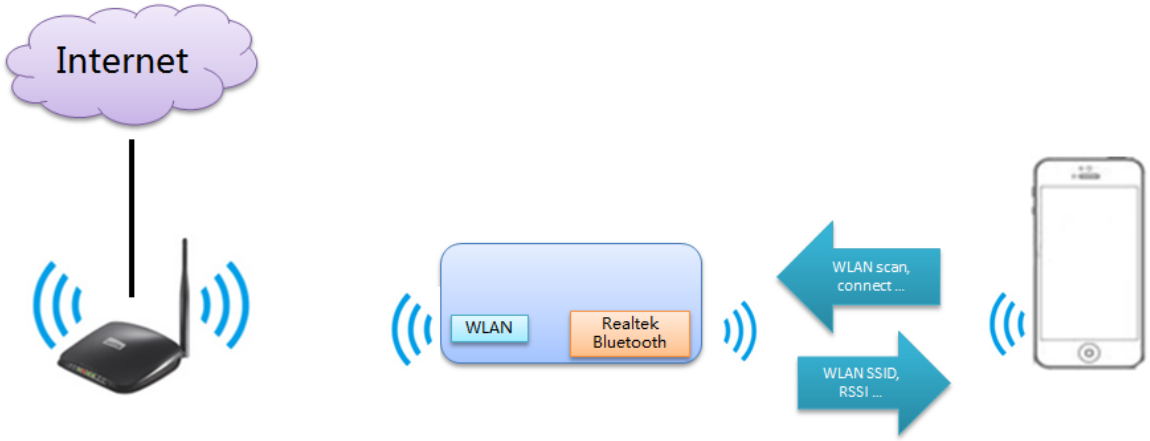


图 1-1 通过蓝牙配置 WLAN 的架构图

手机通过蓝牙连接带 BT 和 WiFi 的设备，实现快速配置 WiFi 的功能。

设备和手机之间的数据交换基于 BLE GATT。WLAN config thread 属于 networkcfg program，它和 gatt-server mainloop 之间通过 pipe 通信。具体实现参考 bluez-5.xx tools/下的 networkcfg.c

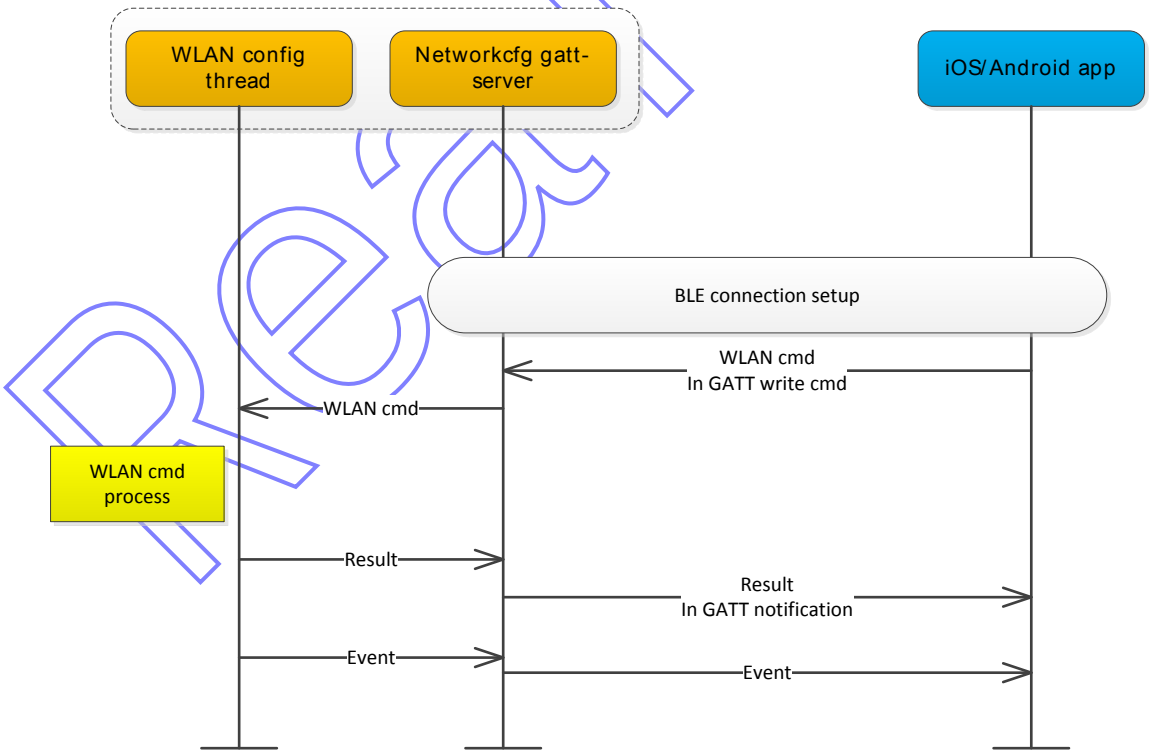


图 1-2 配置 WLAN 的时序图

设备成功连接 AP 之后，Phone app 应该定时发送 Get Connection Status Command，获取连接状态。当发现连接断开之后，停止定时器。

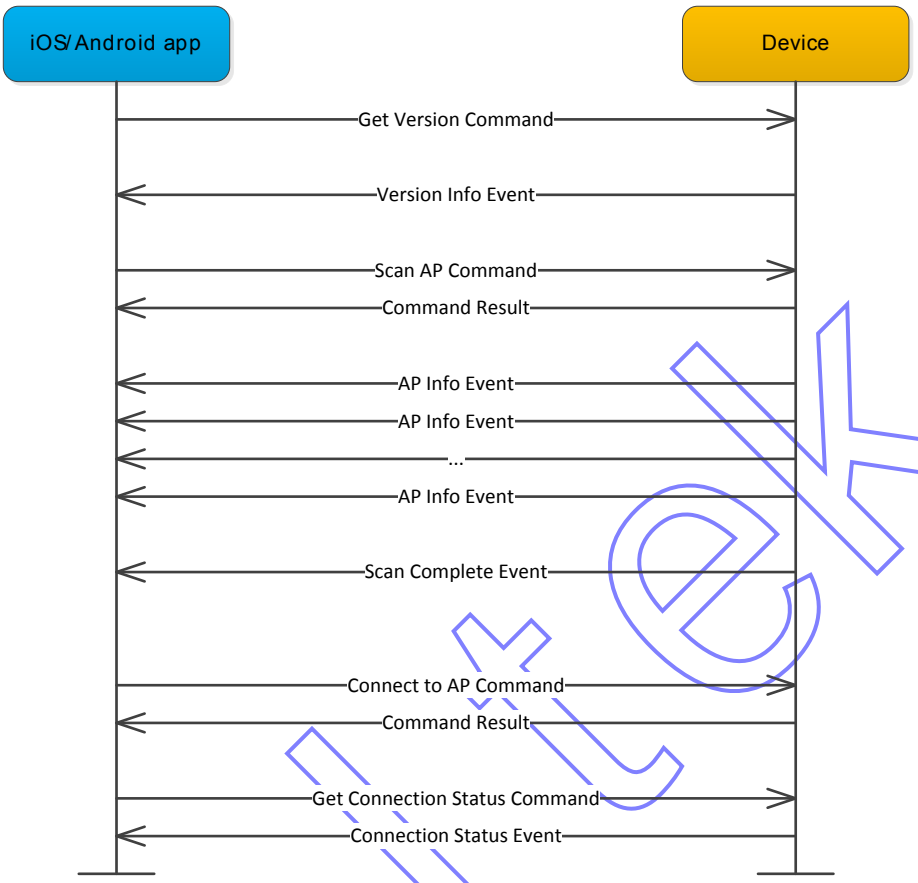


图 1-3 Connect device to AP

Application 发起断开 AP 请求之后，也应该定时发送 Get connection Status Command，获取连接状态。当连接成功断开之后，停止定时器。

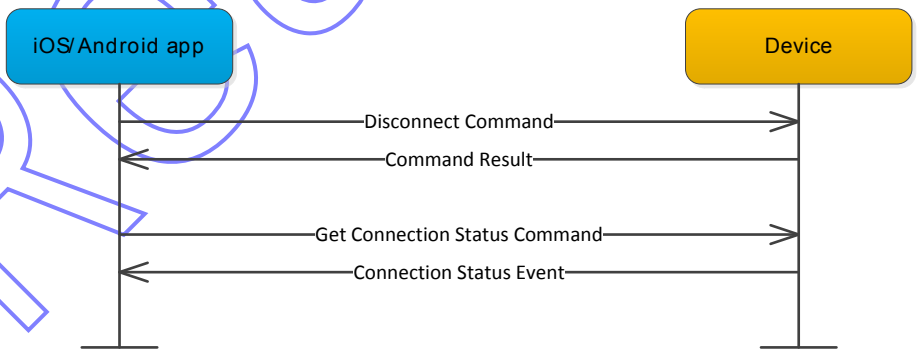


图 1-4 Disconnect device from AP

2 Packet

Packet 的格式如下：

Header	Group	Entry	Parameter Len	Parameters
0xAA	0xXX	0xXX	0xXXXX	0xXXXX…

表 2-1 Packet Format

Header: 0xAA;

Group: command/event 所属的 group;

Entry: command/event 值;

Parameter Len: Parameters 的长度，2-Byte，按 little-endian 格式存放;

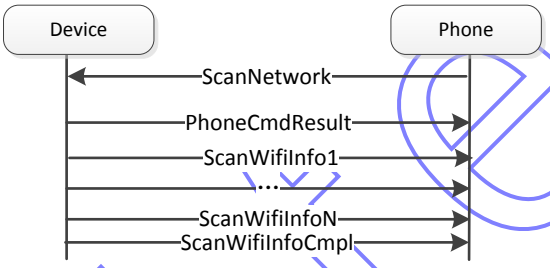
Parameters: command/event parameters。

3 Command

3.1 Scan network

扫描周围 AP

Command	Group	Entry	Command Parameters	Return Events
ScanNetwork	0x01	0x01		PhoneCmdResult ScanWifiInfo



3.2 Connect WiFi AP

连接 AP

Command	Group	Entry	Command Parameters	Return Events
StartConnWifi	0x01	0x02	band(1Byte) (2.4G or 5G) encrypt_type(1Byte) ssid(32Byte) mac(6) password(64)	PhoneCmdResult

Command Parameters:

band (1 byte):

Value	Parameter Description
0x00	2.4G (default)
0x01	5G
0x02-0xFF	Reserved

encrypt_type (1 byte):

Value	Parameter Description
0x00	NONE
0x01	WPA
0x02	WEP
0x03-0xFF	Reserved

ssid (32 bytes)

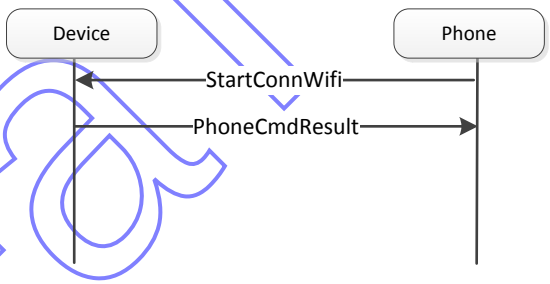
Value	Parameter Description
	AP SSID string including the terminating null byte ('\0')

mac (6 bytes)

Value	Parameter Description
	AP MAC address, little endian Such as 82:2a:a8:97:58:73, which is stored in {0x73, 0x58, 0x97, 0xa8, 0x2a, 0x82}

password (64 bytes)

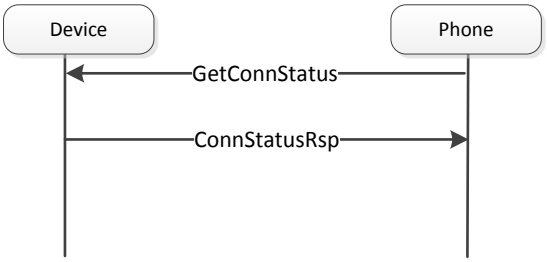
Value	Parameter Description
	A string including the terminating null byte ('\0')



3.3 Get WiFi Connection Status

获取当前 WiFi 的连接状态

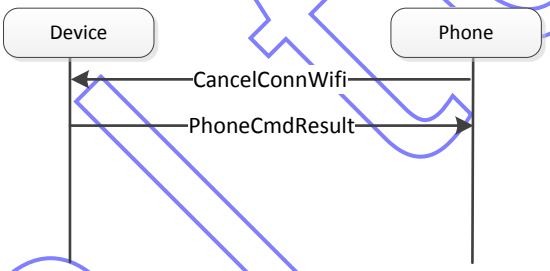
Command	Group	Entry	Command Parameters	Return Events
GetConnStatus	0x01	0x03		ConnStatusRsp



3.4 Cancel WiFi Connection

取消/断开 WiFi 连接

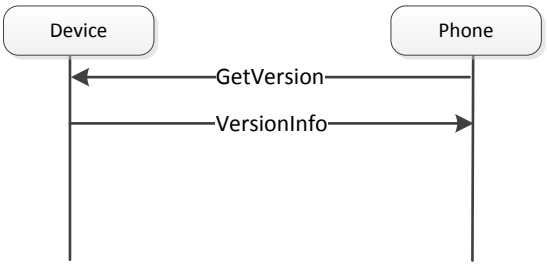
Command	Group	Entry	Command Parameters	Return Events
CancelConnWifi	0x01	0x04		PhoneCmdResult



3.5 Get version information

获取版本信息

Command	Group	Entry	Command Parameters	Return Events
GetVersion	0x01	0x05		VersionInfo



4 Event

4.1 Phone Command result

Phone Command 的执行结果:

Event	Group	Entry	Event Parameters
PhoneCmdResult	0x02	0x01	Status

Event Parameters:

Status (1 byte):

Value	Parameter Description
0x00	Command Succeeded
0x01-0xFF	Command Failed

4.2 WiFi AP information

扫描到的 AP 信息:

Event	Group	Entry	Event Parameters
ScanWifiInfo	0x02	0x02	encrypt_type mac ssid channel_num rssi

Event Parameters:

encrypt_type (1 byte):

Value	Parameter Description
0x00	NONE
0x01	WPA
0x02	WEP
0x03-0xFF	Reserved

mac (6 bytes)

Value	Parameter Description
	AP MAC address, little endian Such as 82:2a:a8:97:58:73, which is stored in {0x73, 0x58, 0x97, 0xa8, 0x2a, 0x82}

ssid (32 bytes)

Value	Parameter Description
	AP SSID string including the terminating null byte ('\0')

channel_num (1 byte)

Value	Parameter Description
N = 0xXX	1: Channel Frequency 2412MHz 2: Channel Frequency 2417MHz 3: Channel Frequency 2422MHz … 14: Channel Frequency 2484MHz

rssi (1 byte)

Value	Parameter Description
N = 0xXX	Signed integer

4.3 WiFi Connection Status response

GetConnStatus command 的返回结果，显示 WiFi 的连接状态:

Event	Group	Entry	Event Parameters
ConnStatusRsp	0x02	0x03	status encrypt_type mac ssid rssi

Event parameters:

Status (1 byte)

Value	Parameter Description
0x00	Connection succeeded
0x01	Connection failed

0x02	Connecting
0x03	Password error
0x04	Disconnected (for network being in disconnection state)
0x04-0xff	Reserved

encrypt_type (1 byte):

Value	Parameter Description
0x00	NONE
0x01	WPA
0x02	WEP
0x03-0xFF	Reserved

mac (6 bytes)

Value	Parameter Description
	AP MAC

ssid (32 bytes)

Value	Parameter Description
	AP SSID string including the terminating null byte ('\0')

rssi (1 byte)

Value	Parameter Description
N = 0xXX	Signed integer

4.4 WiFi AP Scan complete

扫描完成，此 Event 在所有 AP 信息发送给 Phone 之后调用。

Event	Group	Entry	Event Parameters
ScanComplete	0x02	0x04	

4.5 Version Information

返回版本信息:

Event	Group	Entry	Event Parameters
VersionInfo	0x02	0x05	Version

Event parameters:

Version (1 byte)

Value	Parameter Description
N = 0xXX	Version number. Currently it is 0x01