



Wifi&&Eth 共存策略

V0.3

2014-04-14

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Revision History

Version	Date	Changes compared to previous issue
0.1	2013-09-18	Initialize
0.2	2014-02-18	1. 在以太网优先情况下,去除用户手动连接 Wifi
0.3	2014-04-14	1. 更新策略为允许 Wifi 和 Ethernet 同时处于连接状态

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1. 状态概述

1.1. Wifi 状态

1. Close
Wifi 处于关闭状态, 开启按钮处于关闭灰色状态.
2. Open && connected
Wifi 处于开启状态, 并且已经连接到某个 AP.
3. Open && unconnected
Wifi 处于开启状态, 但没有搜索到 AP, 或者没有已经配置的 AP, 处于未连接状态.

1.2. Eth 状态

1. Close
Eth 处于关闭状态, Checkbox 没有被勾选
2. Open && connected
Eth 处于开启状态, 并且网线连接, 且配置成功, 处于连接状态.
3. Open && unconnected
Eth 处于开启状态, 但可能网线未连接, 或者网络配置失败.

2. 共存策略描述

2.1. 预置条件

2.2. 转换规则

1. eth 处于 close, wifi 处于 open connected

1.1. 手动将 eth 由 close 变为 open,

-->如果可以 connected, 如果 Wifi 处于 connected, 默认使用 eth, 并不影响 Wifi 状态

-->如果 eth 打开后处于 unconnected, 不影响当前 wifi 状态.

1.2 对 wifi 的状态改变不会影响 eth 的状态

2. wifi 处于 open unconnected, eth 处于 open connected

2.1. 断开网线

-->如果 wifi 有记录密码的 ap, 则 wifi 自动尝试连接, eth 处于 open unconnected

2.2 关闭 eth

-->如果 wifi 有记录密码的 ap, 则 wifi 自动尝试连接, eth 处于 close

3. wifi 处于 open connected, eth 处于 open unconnected 时

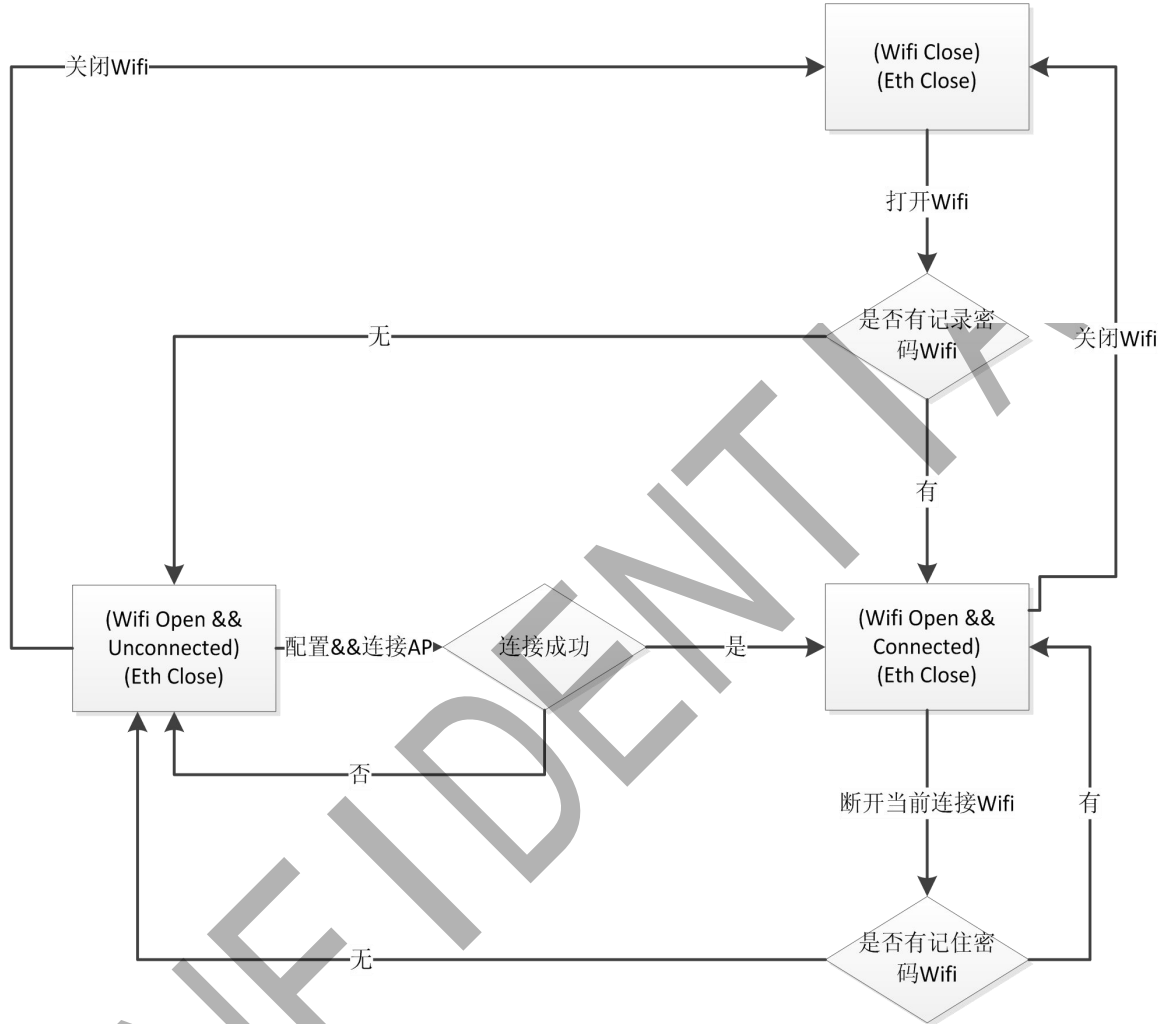
3.1 接入网线

--> 如果配置网络成功, eth 切换到 open connected, wifi 切换到 open unconnected

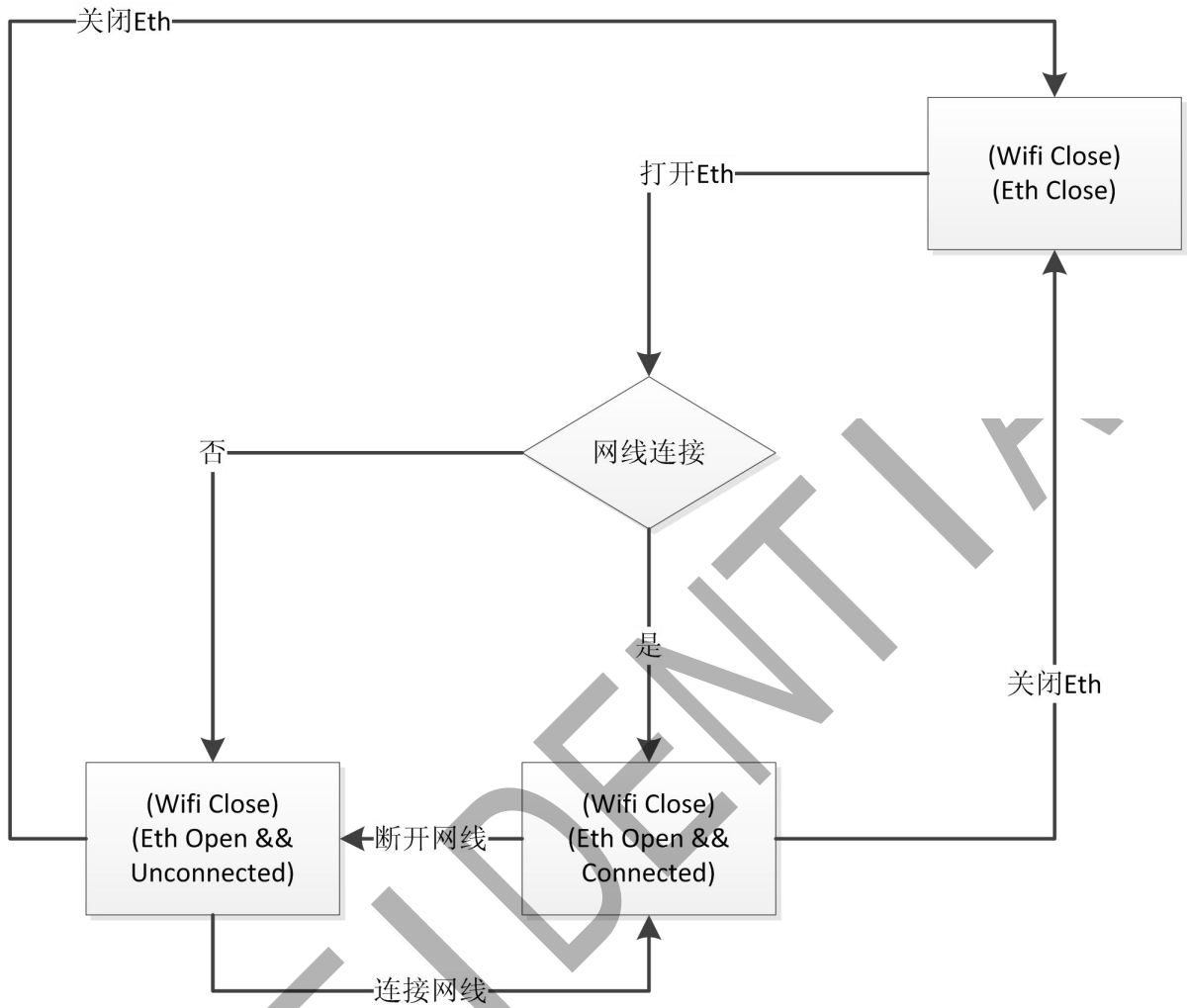
通过上面的三个规则, 可以清楚描述当 Eth 和 Wifi 共存时的状态转换.

2.3. 状态转换图

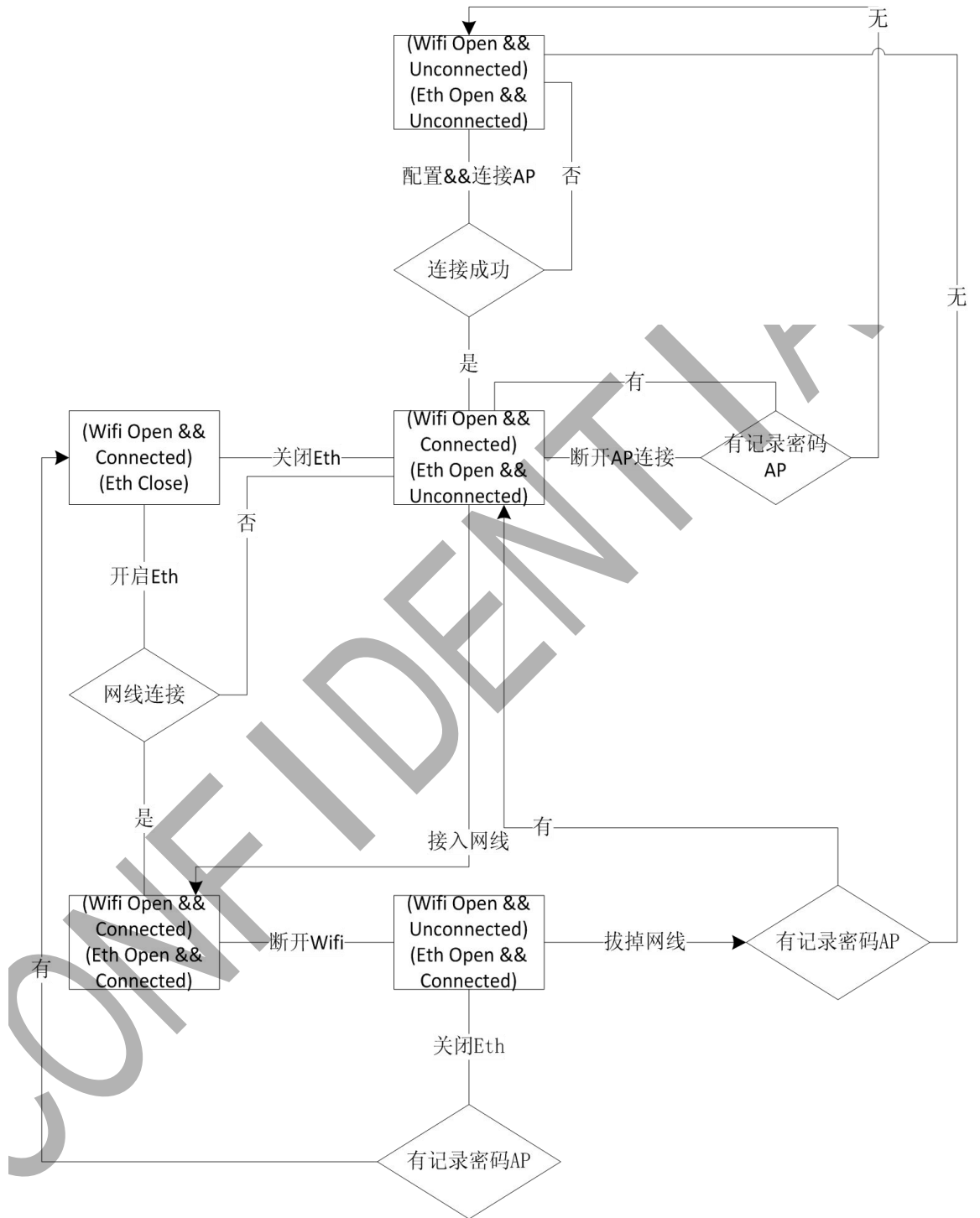
1. 独立 Wifi



2. 独立 Eth



3. Wifi Eth 共存



3. 测试方法

首先将 Box 的 Wifi 和 Ethernet 连接在两个子网不同的两个路由器上(连接在同一个上同样可以,但无法区分), 如下是我的测试环境,

Box 的 Wifi 连接到 Cisco 路由器, 网关是 192.168.1.1

Box 的 Ethernet 连接到 D-Link 路由器, 网关是 192.168.0.1

3.1. 验证 Wifi 和 Ethernet 同时处于连接状态

既然 Wifi 和 Ethernet 同时连接在不同的路由器上, 那就意味着 Box 应该可以 ping 同两个路由器的网关,

1. Ping 通 Cisco 路由器 192.168.1.1 网关

```
root@mars-a31s:/ # ping 192.168.1.1
PING 192.168.1.1 (192.168.1.1) 56(84) bytes of data.
64 bytes from 192.168.1.1: icmp_seq=1 ttl=64 time=87.3 ms
64 bytes from 192.168.1.1: icmp_seq=2 ttl=64 time=56.9 ms
```

2. Ping 通 D-Link 路由器 192.168.0.1 网关

```
root@mars-a31s:/ # ping 192.168.0.1
PING 192.168.0.1 (192.168.0.1) 56(84) bytes of data.
64 bytes from 192.168.0.1: icmp_seq=1 ttl=64 time=0.535 ms
64 bytes from 192.168.0.1: icmp_seq=2 ttl=64 time=0.354 ms
```

如果以上两次验证通过, 证明 Box 的 Wifi 和 Eth 同时连接上了.

3.2. 验证 Ethernet 优先

3.2.1. 验证默认路由是 Eth 连接的网关

通过 traceroute 命令可以获取发送网络包第一跳的 IP 地址, 如果是 Ethernet 连接的网关 IP, 也就证明默认路由是 Ethernet 连接的网关.

1. 首先获取一个外网地址 IP, 这里以 baidu.com 为例

```
130|root@mars-a31s:/ # ping baidu.com
PING baidu.com (123.125.114.144) 56(84) bytes of data.
64 bytes from 123.125.114.144: icmp_seq=1 ttl=50 time=62.7 ms
```

2. 对外网 IP 执行 traceroute 命令, 如下,

```
root@mars-a31s:/ # busybox traceroute 123.125.114.144
traceroute to 123.125.114.144 (123.125.114.144), 30 hops max, 38 byte packets
 1  192.168.0.1 (192.168.0.1)  0.584 ms  0.344 ms  0.338 ms
 2  192.168.1.1 (192.168.1.1)  0.831 ms  0.767 ms  0.889 ms
```

```
3 192.168.7.1 (192.168.7.1) 1.968 ms 2.137 ms 1.889 ms
4 113.76.152.1 (113.76.152.1) 15.491 ms 3.395 ms 5.146 ms
5 119.146.104.53 (119.146.104.53) 5.285 ms 4.912 ms 4.772 ms
6 183.59.0.206 (183.59.0.206) 5.974 ms 6.104 ms 6.529 ms
7 183.59.0.246 (183.59.0.246) 9.204 ms 7.969 ms 7.994 ms
8 202.97.46.114 (202.97.46.114) 12.095 ms 11.058 ms 11.948 ms
```

从以上输出可以看出 Box 向外网发送数据包时, 是通过 Ethernet 连接的路由器发往外网的.

3.2.2. 验证默认 DNS 是 Eth 分配的

通过 tcpdump 抓包和 ping 不同的域名可以验证 default dns server, 如下,

1. 执行 tcpdump 抓网络包,

```
root@mars-a31s:/ # tcpdump -i any -s 0
tcpdump: WARNING: Promiscuous mode not supported on the "any" device
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on any, link-type LINUX_SLL (Linux cooked), capture size 65535 bytes
21:59:53.899292 IP 192.168.0.111.8900 > 192.168.0.1.domain: 23535+ A? baidu.com. (27)
21:59:53.920574 IP 192.168.0.1.domain > 192.168.0.111.8900: 23535 3/0/0 A 220.181.111.86, A
123.125.114.144, A 220.181.111.85 (75)
21:59:53.921695 IP 192.168.0.111 > 220.181.111.86: ICMP echo request, id 18, seq 1, length 64
21:59:53.965273 IP 220.181.111.86 > 192.168.0.111: ICMP echo reply, id 18, seq 1, length 64
21:59:53.966173 IP 192.168.0.111.4126 > 192.168.0.1.domain: 24104+ PTR? 86.111.181.220.in-addr.arpa.
(45)
21:59:53.967570 IP 192.168.0.1.domain > 192.168.0.111.4126: 24104 NXDomain 0/0/0 (45)
```

2. 同时在另一个终端中执行 ping 命令

```
shell@mars-a31s:/ # ping baidu.com
PING baidu.com (220.181.111.86) 56(84) bytes of data.
64 bytes from 220.181.111.86: icmp_seq=1 ttl=51 time=43.7 ms
```

从 tcpdump 抓包输出的紫色部分可以看出, Box 搜索指定域名时是去以太网连接的路由提供的 DNS Server 地址搜索的. 证明默认 dns 是 Eth 的.

4. 注意事项

1. PPPoE 网络连接被看做和 Eth 相同, 有且 Eth 和 PPPoE 拨号是互斥的, 以上的策略说明将 eth 替换为 PPPoE 依然成立.

5. Declaration

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