RGx00U&RM500U Series

USBnet&Ethernet Call Application Note

5G Module Series

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Quectel Wireless Solutions Co., Ltd.
Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai 200233, China
Tel: +86 21 5108 6236
Email: info@quectel.com

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About the Document

Revision History

Version	Date	Author	Description
-	2020-09-14	Baron QIAN/ Rami ZHANG	Creation of the document
1.0	2023-07-24	Rami ZHANG	First official release

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1 Introduction

This document introduces how to use Quectel RG200U series, RG500U series and RM500U series modules to make the USBnet and Ethernet call on a Windows or Linux host, including call methods and call modes, call results and USBnet or Ethernet status query, etc.

2 USBnet&Ethernet Call Description

The USBnet call and Ethernet call indicate that the host accesses the wireless terminal through the standard interface defined by the specification and gets the IP address and DNS address to perform data communication services.

2.1. USBnet&Ethernet Call Method and Mode

RG200U series, RG500U series and RM500U series modules support USBnet call and Ethernet call. Call modes for USBnet and Ethernet are the same. For detailed information about USBnet call methods, see ***Chapter 3.1.1***.

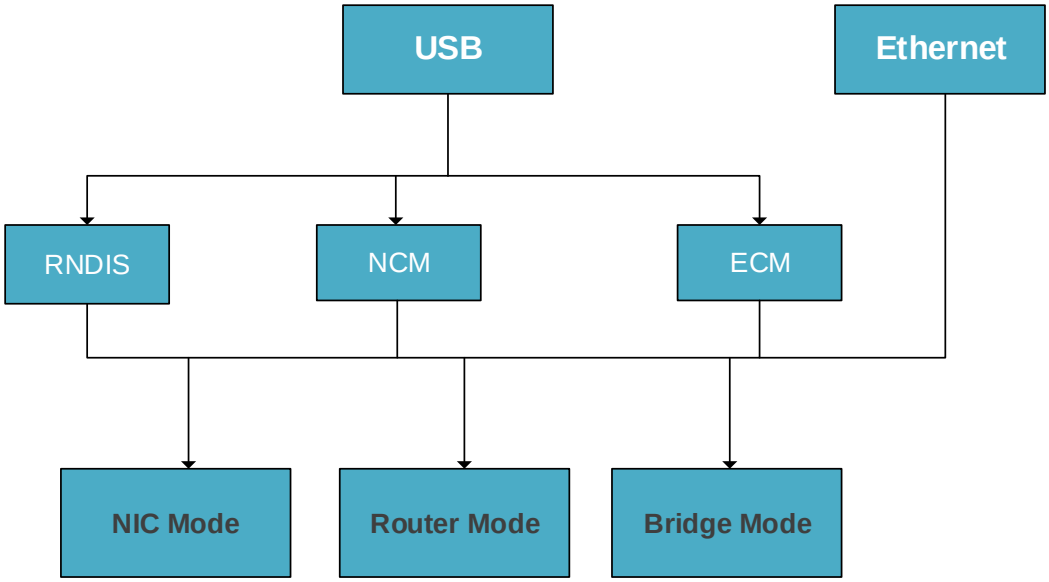

Figure 1: USBnet&Ethernet Call Method and Mode

2.2. USBnet&Ethernet Call Data Path Diagram

In NIC mode, router mode and bridge mode, different data transmission protocols can be switched between the module and the host. In these three different modes, the data channels between the module and the host are as follows:

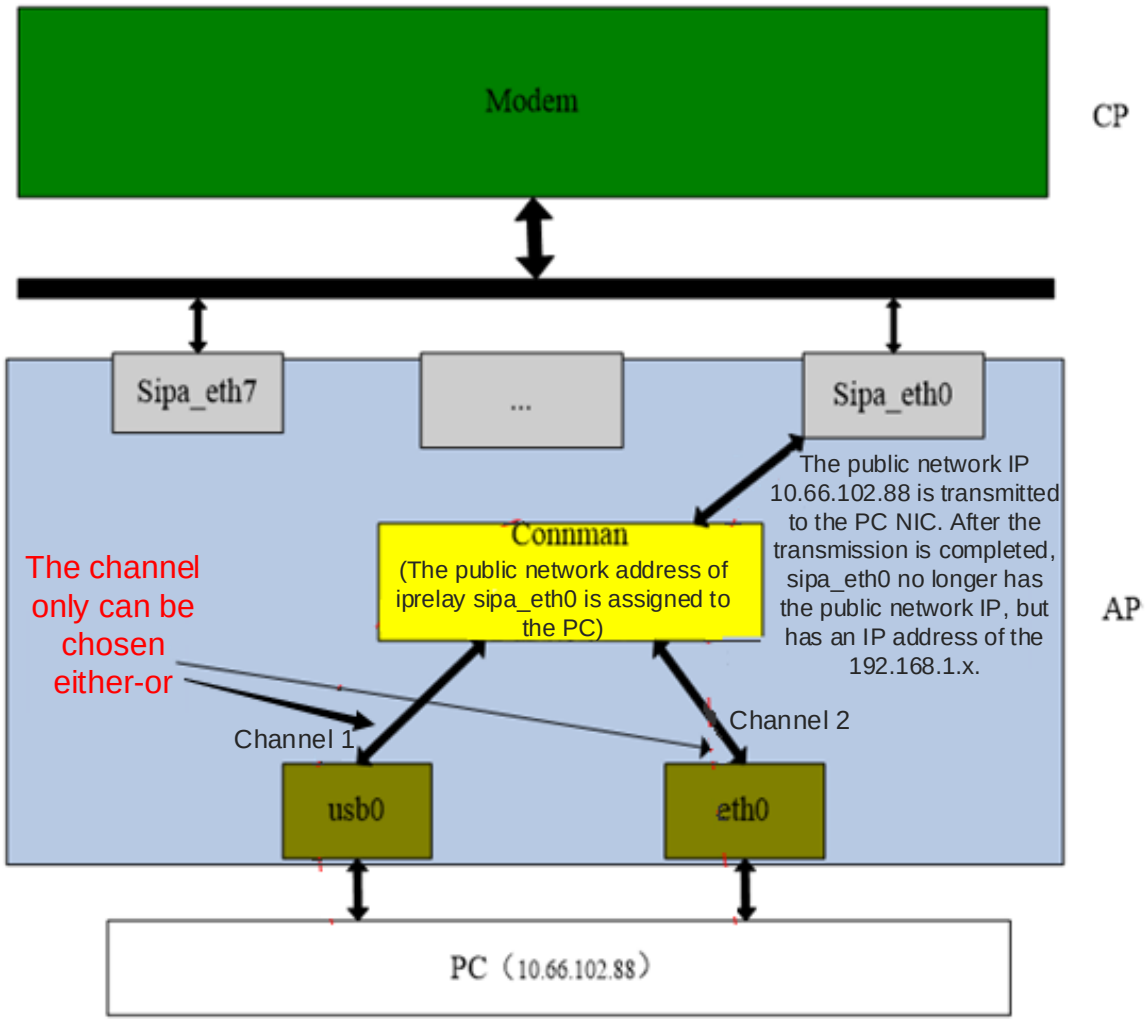

Figure 2: Data Path Diagram for NIC Mode

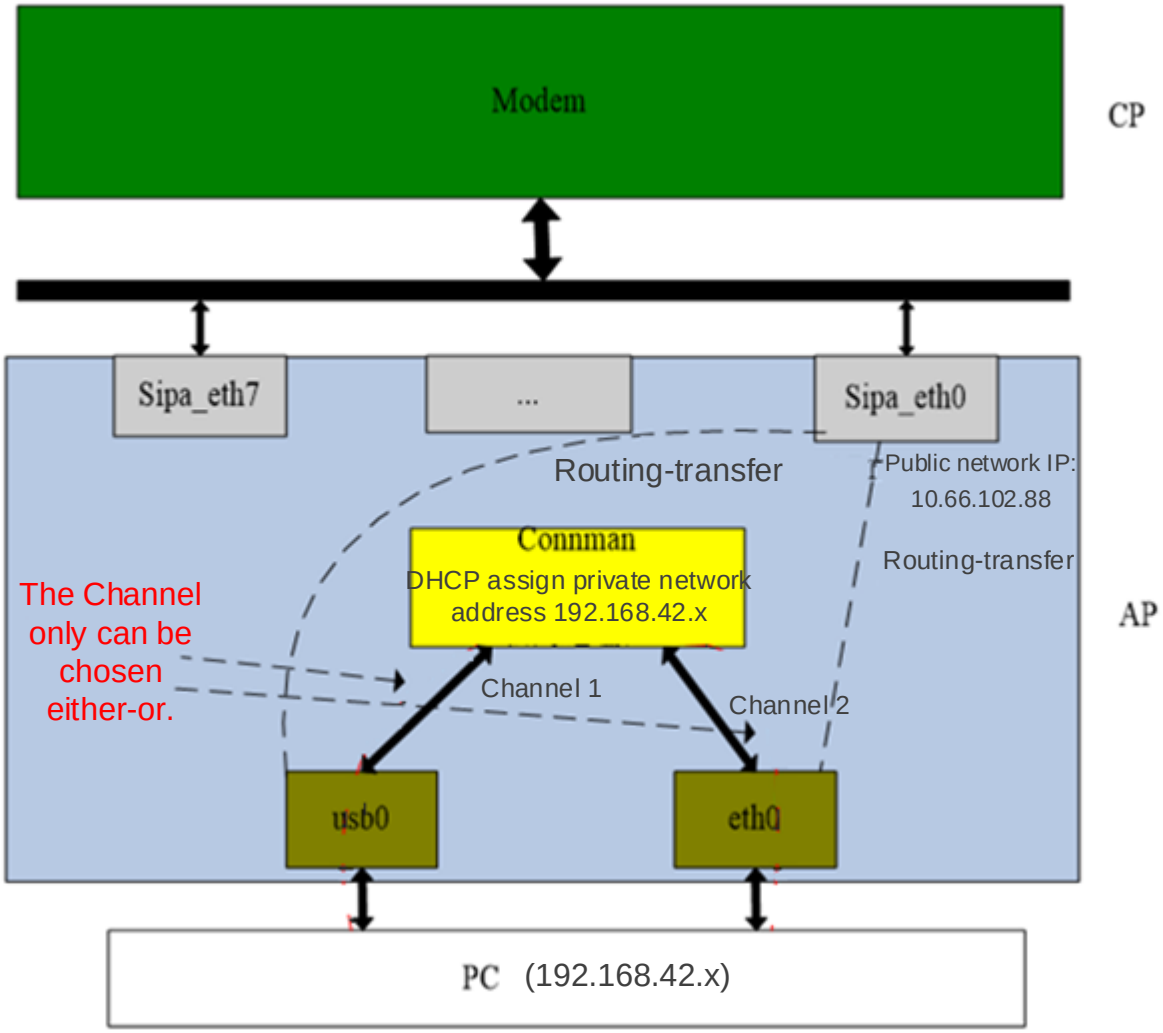

Figure 3: Data Path Diagram for Router Mode

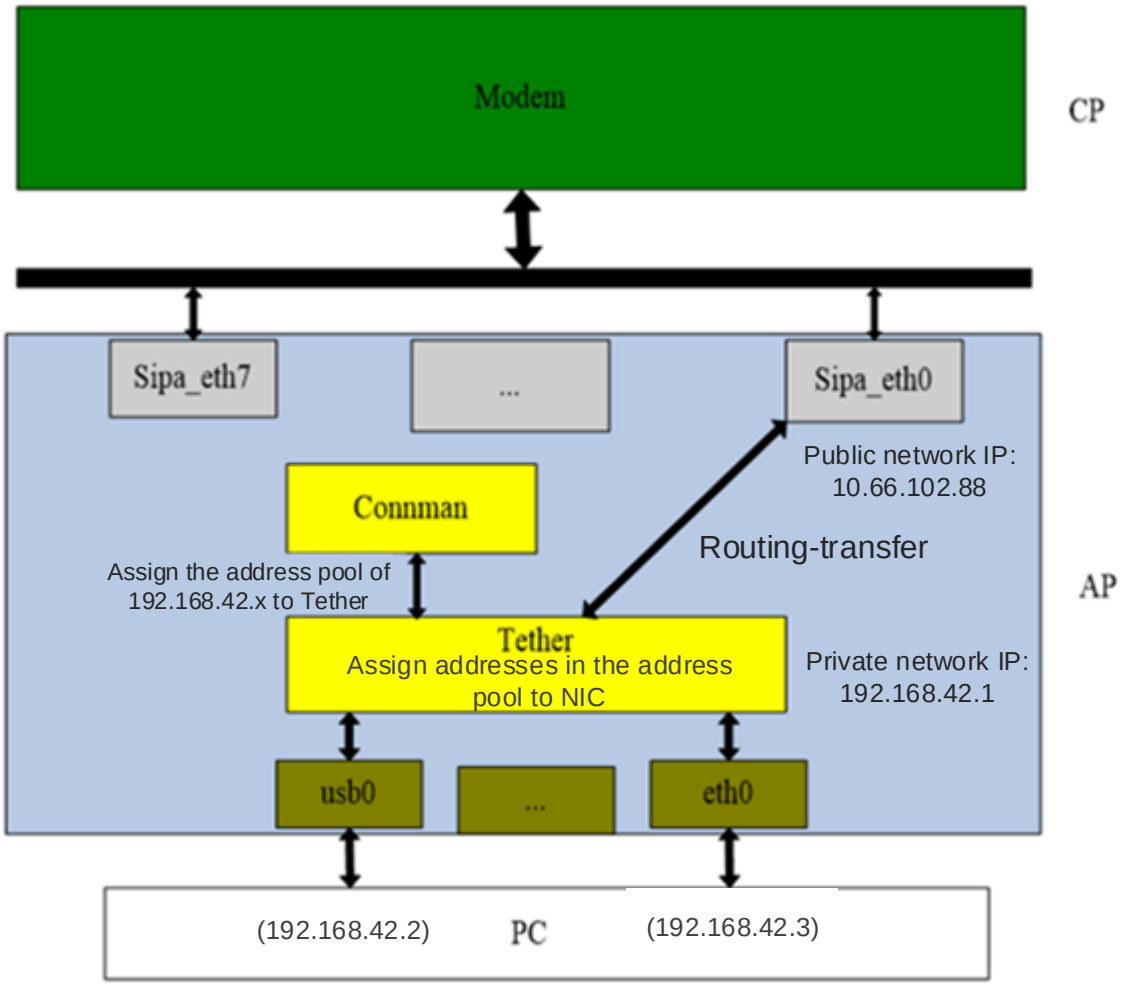

Figure 4: Data Path Diagram for Bridge Mode

NOTE

1. In NIC mode and router mode, if both USBnet and Ethernet are connected at the same time, only one of them can get an IP address. When USBnet and Ethernet are enabled at the same time, the Ethernet gets the IP address first.
2. In bridge mode, if both USBnet and Ethernet are connected at the same time, both of them can get IP addresses.
3. In NIC mode, the IP address obtained by the host is that obtained by the Core, and the module can access the external network.
4. In bridge mode and router mode, the IP address obtained by the host is that assigned by the internal LAN of the module, and the module can access the external network.

3 USBnet&Ethernet Call Introduction

This chapter introduces the steps of Internet access by USBnet call and Ethernet call. First, configure the USBnet or Ethernet call modes and methods by executing **AT+QCFG**. Then make a call by executing **AT+QNETDEVCTL**. If the call is made successfully, you can query USBnet or Ethernet status by executing **AT+QNETDEVSTATUS**. See ***document [1]*** for more details about the AT commands.

3.1. Configure USBnet

3.1.1. Configure USBnet Call Method and Driver Type

3.1.1.1. In Windows

Execute **AT+QCFG="usbnet",3** to configure the call method and driver type as RNDIS.

3.1.1.2. In Linux

Execute **AT+QCFG="usbnet",5** to configure the call method and driver type as NCM.
Or execute **AT+QCFG="usbnet",1** to configure the call method and driver type as ECM.
Or execute **AT+QCFG="usbnet",3** to configure the call method and driver type as RNDIS.

NOTE

The configuration takes effect after the module is rebooted. It is recommended to query the current configuration by **AT+QCFG="usbnet"** after boot-up. If the current configuration is not as expected, you can configure the module as described above and then reboot the module.

3.1.2. Configure USBnet Call Mode

Execute **AT+QCFG="nat",0** to configure the call mode as NIC mode.
Or execute **AT+QCFG="nat",1** to configure the call mode as router mode.
Or execute **AT+QCFG="nat",2** to configure the call mode as bridge mode.

NOTE

The configuration takes effect after the module is rebooted. It is recommended to query the current call mode by executing **AT+QCFG="nat"** after boot-up. If the current configuration is not as expected, you can configure the module as described above and then reboot the module.

3.2. Configure Ethernet

The module supports enabling or disabling Ethernet call through AT commands, and Ethernet call is enabled by default.

Execute **AT+QCFG="ethernet",1** to enable Ethernet call.
Or execute **AT+QCFG="ethernet",0** to disable Ethernet call.

NOTE

The configuration takes effect after the module is rebooted. It is recommended to query the current call mode by executing **AT+QCFG="ethernet"** after boot-up. If the current configuration is different from your expectation, you can configure the module as described above and then reboot the module.

3.3. Call Result

If the call is made successfully, the host creates a corresponding USBnet/Ethernet connection. You can check the call result by querying the USBnet/Ethernet status.

3.3.1. Call Result in Windows

Windows 7 is taken as an example. Open the "**Control Panel**" window, click "**Network and Internet**", then select the created RNDIS USBnet/Ethernet to view the call status.

Figure 5: RNDIS USBnet/Ethernet in Windows

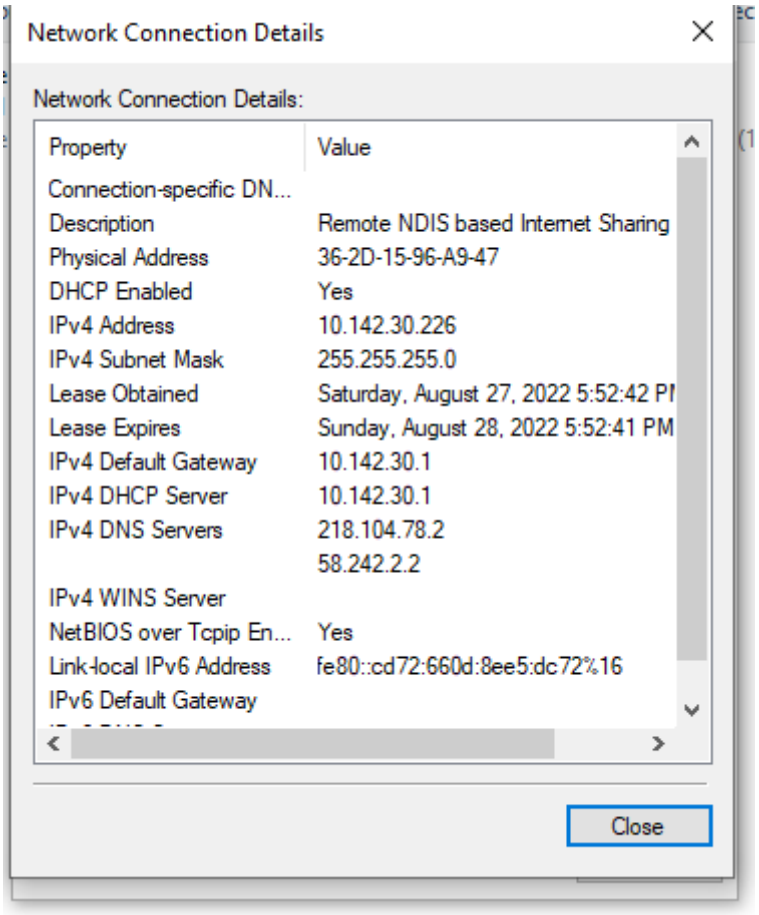

Figure 6: Call Status in Windows

3.3.2. Call Result in Linux

Execute **ifconfig** on the host to view IP addresses of current USBnet/Ethernet, as shown in the following figure:

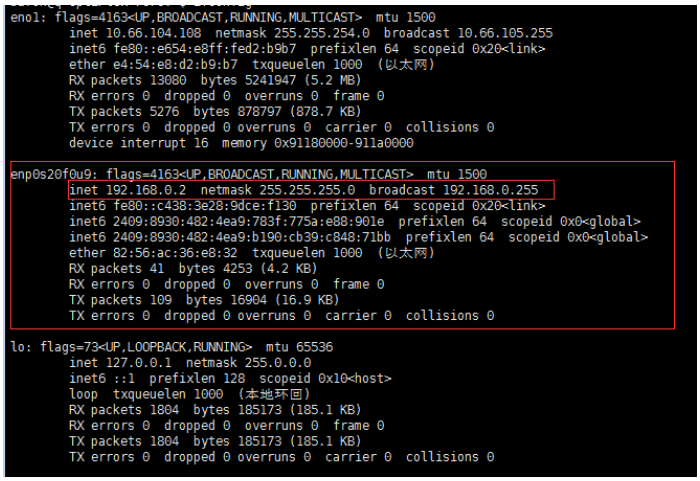

Figure 7: Call Result in Linux

4 Appendix References

Table 1: Related Document

Document Name
[1] Quectel_RGx00U&RM500U_Series_AT_Commands_Manual

Table 2: Terms and Abbreviations

Abbreviation	Description
AP	Application Processor
APN	Access Point Name
CHAP	Challenge Handshake Authentication Protocol
Connman	Connection Manager
CP	Cellular Processor
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
ECM	Ethernet Control Model
ID	Identifier
IP	Internet Protocol
IPv4	Internet Protocol Version 4
IPv6	Internet Protocol Version 6
LAN	Local Area Network
NCM	Network Control Model
NIC	Network Interface Card

PAP	Password Authentication Protocol
PDP	Packet Data Protocol
RNDIS	Remote Network Driver Interface Specification
USB	Universal Serial Bus