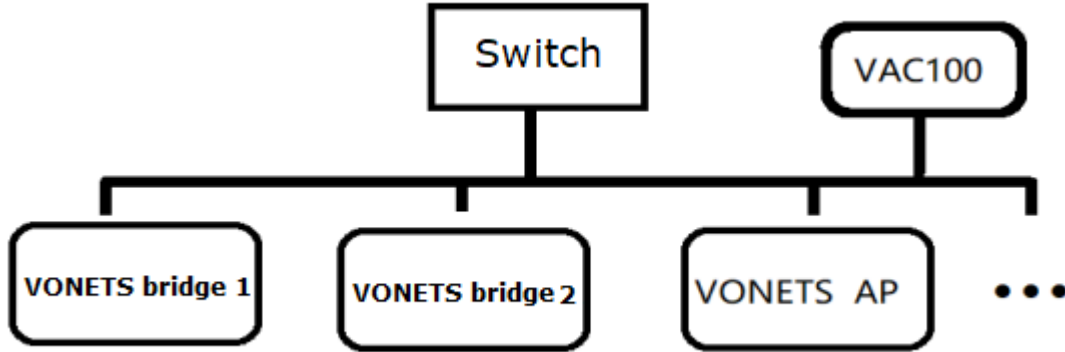# VONETS Configuration Management Protocol Instruction(2.0)

Ⅰ VONETS configuration management topology

- VAC100 is a dedicated device for centralized management of VONETS bridge / AP (AC manager);
- VONETS configuration management protocol has two communication methods UDP and MAC layer;
- AC manager and VONETS bridge / AP must be in the same LAN; when using UDP communication method, the IP of AC manager and VONETS bridge / AP must be in the same network segment;
- The AC manager can centrally manage, configure, and query the VONETS bridge / AP device through the VONETS configuration management protocol.

Ⅱ VONETS configuration management protocol has four communication methods: UDP, TCP, MAC, UART, TCP or UART doesn't support broadcast requests. The default is UDP communication mode, MAC communication mode will consume more device CPU resources.

Ⅲ VONETS configuration management protocol has the following data packet types:

Form 1				
Packet type (2 bytes)	Packet type description	Direction		Broadcast/Unicast
		Send	Receive	
61 61	Specific command request	AC manager	VONETS bridge/AP	Broadcast/unicast
62 62	Specific command response (ACK)	VONETS bridge/AP	AC manager	Unicast
63 63	Specific command response confirmation(ACK_OK)	AC manager	VONETS bridge/AP	Unicast
64 64	Specific command Illegal response (NAK)	VONETS bridge/AP	AC manager	Unicast
71 71	NV data read and write requests	AC manager	VONETS bridge/AP	Broadcast or unicast
72 72	NV data read and write response	VONETS bridge/AP	AC manager	Unicast

	(ACK)			
73 73	NV data read and write response confirmation (ACK_OK)	AC manager	VONETS bridge/AP	Unicast
74 74	NV Data read and write illegal or failed (NAK)	VONETS bridge/AP	AC manager	Unicast
81 81	Query request Q	AC manager	VONETS bridge/AP	Broadcast or unicast
82 82	Query response (ACK)	VONETS bridge/AP	AC manager	Unicast
83 83	Query response confirmation (ACK_OK)	AC manager	VONETS bridge/AP	Unicast

- The request packet is characterized by X1X1 and is the beginning of the process;
- The response packet is the response of the device to the requester, which is divided into two types:
  1. ACK (X2X2) The result of successfully returning the result
  2. NAK (X4X4) The request is illegal or the operation fails

- Response confirmation packet (X3X3) is sent by requester, indicating that the requester has received a response from the device;
- After the device receives response confirmation packet, the device will no longer respond to requests with the same packet ID, which can avoid repeated responses to the same request.

Ⅳ VONETS configuration management protocol data packet structure

Configuration management data packet structure			
Configuration management data packet header (hexadecimal)			PAYLOAD Packet content (Plain text)
Packet type(2 bytes)	Packet length (2 bytes)	Packet ID(2 bytes)	
Refer to Form 1	The length of packet content	0x0000～0xffff	<=1500 bytes

- The packet length is 2 bytes, it means the length of "packet content(PAYLOAD)" in data packet;
- Packet ID is numbered by the initiator of data packet, and generally increases from 0x0000, and repeats after reaching 0xffff; The request packet ID is the same as its response packet ID;
- The length of packet content is less or equal to 1500 bytes;

Ⅴ Detailed description of "packet content" of various types of data packets
5.1 Specific command request (6161) "Package content"--(PAYLOAD)
　　5.1.1. Packet content structure (Plain text)

Specific command data packet content structure					
User ID	Delimiter	Password	Delimiter	Linux shell script command	Terminator

| user=*** | ;& | pass=*** | ;& | XXX | ;&;& |

5.1.2. Supported Linux shell command

Linux shell script command			
Shell command	Command role	Operation instruction	Repeat interval (second)
reboot	Reboot device	Answer first, then execute	Invalid
wifi_scan	Scan and get hotspot lists	Execute first, then answer	2
get_mem_hotspots	Get memory hotspot list	Execute first, then answer	1
clean_mem_hotspots	Clean memory hotspot list	Execute first, then answer	2
add_one_hotspot	Add a new hotspot	Execute first, then answer	2
allow_connect	Enable or forbidden connecting hotspot	Execute first, then answer	1
reset	Reset to the factory default parameters	Answer first, then execute	Invalid

Remark: The repeat interval is the minimum time interval for the requester to send the request again after receiving the response.

5.2 Specific command response packet (6262) "Package content"

5.2.1. Packet content structure (Plain text)

Specific command response packet "Packet content"					
Specific command response packet feature string	Delimiter	Original Linux shell command	Delimiter	Linux shell Script command response data body	Terminator
SPCMD_ACK	;&	XXX	;&	XXX	;&;&

5.2.2 Linux shell script command response data body

    5.2.1   For response packets with multiple lines of data, group the packets according to the following two rules;

    5.2.2   "：：" is parameters delimiter, "；&" is end of line, "；&；&" is the end of data packet;

    5.2.3   There is no end-of-line character in the last line of the packet, and it ends directly with the end-of-line character

Linux script command	Linux shell Script command specific response data
reboot	ok
reset	ok
allow_connect	ok
clean_mem_hotspots	ok
get_mem_hotspots	Each line has three parameters in turn: band, SSID, BSSID (MAC address of the hot spot). Examples as below: 2;:VONETS_2358;:00:17:13:45:23:58;& 5;:VONETS_9898;:00:17:13:45:98:98;& 2;:HUAWEI-71D8;:00:45:83:B5:71:D8;&;&
add_one_hotspot	Slightly (top secret)
wifi_scan	1.The first line has two parameters in sequence: the total number of data packets and the packet ID. (When there is too much data, it will be divided into multiple packets and sent); 2. The second line starts with 8 parameters in sequence: SSID, BSSID, WiFi channel,Relative signal strength, RSSI(dbm), WiFi verification method、WiFi encryption type, WiFi band; 3.Scan failure will return NAK. Example as below: 1;:1;& HUAWEI-DR3HTC;:14:9d:09:c4:07:b0;:6;:100;:-18;:WPAPSK-WPA2PSK;:TKIPAES;:2.4G;& VONETS_QINFANG;:00:17:13:10:3f:92;:157;:100;:-30;:WPA2-PSK;:AES;:5G;& VONETS_1618;:00:17:13:10:16:18;:157;:100;:-40;:WPA2-PSK;:AES;:5G;&;&

5.3 NV read and write data packet(7171) "packet content"

5.3.1 NV data read command packet content structure (plain text)

NV data read operation packet content structure											
User name	Delimiter	Password	Delimiter	NV read response	Delimiter	NV parameter1	Delimiter	NV parameter 2	Delimiter	...	Terminator
user=***	;&	pass=***	;&	nv_read	;&	***	;&	***	;&	...	;&;&

5.3.2 NV data write command packet content structure (plain text)

NV data write operation packet content structure											
User name	Delimiter	Password	Delimiter	NV Write response	Delimiter	NV parameter1=value	Delimiter	NV parameter 2=value	Delimiter	...	Terminator
user=***	;&	pass=***	;&	nv_write	;&	name1=***	;&	name2=***	;&	...	;&;&

The specific NV parameters are described in the document "*VONETS V Series NVram Parameter Description.doc*" ;

5.4 NV data read write command response packet(7272) "packet content"

	Specific command response feature string	Delimiter	NV parameter1= value	Delimiter	NV parameter2= value	Delimiter	...	Terminator
Read response	NVRCMD_ACK	;&	name1= ***	;&	name2= ***	;&	...	;&;&
Write response	NVWCMD_ACK	;&	name1= ***	;&	name2= ***	;&	...	;&;&

NV data read write packet response content structure

5.5 Query packet(8181) "Packet content"

Query packet content structure	
Query command	Terminator
search	;&;&

5.6 Query response packet (8282) "packet content"
5.6.1 Query response packet content structure (Plain text)

Response content header				Response data subject **In line units, each line contains sub-parameters**	End of packet Terminator
Query response feature string	Delimiter	Query command	Delimiter		
SPCMD_ACK	;&	search	;&	***	;&;&

Query packet response content structure

5.6.2 Example of query response packet content (plain text)

5.6.2.1 The main body of the response data is the basic unit of the behavior, and they are divided to sub-parameters in each row.

5.6.2.2　The basic pattern of each line is: main parameter name = parameter value, where the parameter value can also include sub-parameter values, then the sub-parameter values are separated by sub-parameter separators and listed in sequence.

5.6.2.3 "：：" is the delimiter of sub-parameter, ";&" is end of line, ";&;&" is data packet terminator.

5.6.2.4　There is no end-of-line character in the last line of the data packet, and it ends directly with an end-of-line character.

Example 1. AP is 2.4G and 5G dual-band, 2.4G and 5G have a local hotspot, 2.4G and 5G have not been configured for wireless Internet access, AP uses DHCP to obtain IP address:

SPCMD_ACK;&Search;&　　（Response content header, thereafter between the end character, it is the response data body）

model=VM5G;&

mac=00:17:13:10:62:B8;&

ip=10.0.0.100;&

hw_ver=VER1.0;&

dev_name=VM5G_C3B6;&

network=;:0;:DHCP;:;:;:;:;:;:1;&

apcli_cur_connect=2.4G;:;:;:0;:0;:1;:0;:1;&

ssid_num=1;:0;:0;:1;&

local_hotspots_0=VONETS_2.4G_C3B6;:0;:WPA2PSK;:AES;:1;:7;:0;:0&

g5_ssid_num=1;:1;:0;:0;&

g5_local_hotspots_0=VONETS_5G_C3B6;:0;:WPA2PSK;:AES;:1;:149;:1;:0&;&

Example 2.   AP is 2.4G single band, 2.4G has a local hotspot, 2.4G is configured for wireless Internet access, and the AP uses DHCP to obtain an IP address;

SPCMD_ACK;&search;&   (Response header)

model=VAP11G_300;&

mac=00:17:13:22:18:BA;&

ip=10.0.0.200;&

hw_ver=VER6.0;&

dev_name=VAP11G_300_18B8;&

network=;:0;:DHCP;:;:;:;:;:;:1;&

apcli_cur_connect=5G;:VONETS_1618_5G;:00:17:13:10:16:18;:1;:2;:1;:1&

ssid_num=1;:1;:1;:0;&

local_hotspots_0=VONETS_2.4G_18B8;:0;:WPA2PSK;:AES;:1;:7;:1;:0;&;&

5.6.3 Query response data main line first main parameter name

Query response data subject parameter description	
Main parameter name at the beginning of the line	Parameters Description
model	Device model, such as VM5G
mac	Device MAC, such as 00:17:13:00:00:08
ip	Device IP, such as 192.168.254.254
hw_ver	Device hardware version, such as VER1.0
dev_name	Device name, such as VM5G_0008
network	Device network configuration
ntp	NTP timing function configuration
apcli_cur_connect	Device current connection status parameters
ssid_num	Number and related parameters of local 2.4G hotspot
g5_ssid_num	Number and related parameters of local 5G hotspot
local_hotspots_0	Detailed configuration of the device's 2.4G hotspot 1, refer to 5.6.4.6
local_hotspots_1	Detailed configuration of the device's

	2.4G hotspot 2, refer to 5.6.4.6
local_hotspots_2	Detailed configuration of the device's 2.4G hotspot 3, refer to 5.6.4.6
g5_local_hotspots_0	Detailed configuration of the device's 5G hotspot 1, refer to 5.6.4.6
g5_local_hotspots_1	Detailed configuration of the device's 5G hotspot 2, refer to 5.6.4.6
g5_local_hotspots_2	Detailed configuration of the device's 5G hotspot 3, refer to 5.6.4.6

5.6.4

Detailed description of sub-parameters in the body of the query response data

5.6.4.1 Device user name password(login)

Sub-parameter and sequence	Sub-parameter value
Ordinary user name	xxx
Ordinary user password	xxx

5.6.4.2 Device network configuration(network)

Sub-parameter and sequence	Sub-parameter value
Whether to enable management IP	0(Not enabled) 1(Enable)
Device working mode	0(Bridge mode) 1(Router mode)
Device access method	DHCP(Dynamic acquisition) STATIC(Static IP)
Device IP address	x.x.x.x
Device Subnet mask	x.x.x.x
Device gateway IP	x.x.x.x
Device DNS1 IP	x.x.x.x
Device DNS2 IP	x.x.x.x
Whether to enable the DHCP server	0(Not enabled) 1(Enable)

5.6.4.3 NTP timing function configuration(ntp)

Sub-parameter and sequence	Sub-parameter value
Whether to enable NTP protocol proofreading time	0(Not enabled) 1(Enable)
Time zone	Time zone value
NTP Server1	Domain name or IP
NTP Server2	Domain name or IP
NTP Server3	Domain name or IP
Whether to allow scheduled restart	0（Disable） 1（Enable）
Reboot time _hh	Hour（0--24）
Rebot time _mm	Minute（0--60）

5.6.4.4 Device current connection status parameters(apcli_cur_connect)

Sub-parameter and sequence	Sub-parameter value
Band of the currently connected hotspot	2.4G or 5G
SSID of the currently connected hotspot	xxx
BSSID(MAC) of the currently connected hotspot	xx:xx:xx:xx:xx:xx
Connection status of the currently connected hotspot	0(disconnect) 1(connected)
Bridge transparent transmission mode	0(IP layer transparent transmission) 1(MAC layer transparent transmission
Matching mode when connecting to hotspot	1(Exact match) 2(SSID password match)
Whether to allow smart matching when connecting to hotspot	0（Forbid） 1（allow）
Whether to synchronize hotspot parameters to local hotspot	0(Not synchronized) 1(synchronized)

5.6.4.5　Number of devices 2.4G hotspots and number of devices 5G hotspots(ssid_num and g5_ssid_num)

Sub-parameter and sequence	Sub-parameter value
Number of the device's hotspot	1－3
Local hot spot hidden map value	0(not hidden hotspot) 1(hide hotspot) 1. Single hotspot: 0 or 1 2. When there are multiple hotspots: 0:0:0 or 0:1:0
Local WiFi hotspot off map value	0（Open hotspot） 1（Close hotspot） 1.　Single hotspot: 0 or 1 2.　When there are multiple hot spots: 0:0:0 or 0:1:1
Whether the local WiFi hardware is disabled	0（Not disabled） 1（Disable）

5.6.4.6 Detailed configuration of the device's local hotspot

Sub-parameter and sequence	Sub-parameter value
Local hotspot SSID	xxx
Number of WiFi clients connected to local hotspots	0 indicates that no client is currently connected to the local hotspot.
Local AP wireless authentication mode	OPEN、SHARED、WPAPSK、WPA2PSK、WPAPSKWPA2PSK

Local AP wireless encryption	NONE、WEP、TKIP、AES、TKIPAES
Local AP wireless DefaultKeyID	1－4
Local AP wireless channel	2.4G: 1-14 5G:36,40,44,48,52,56,60,64,100,104,108,112,116,120,124,128,132,136,140,149,153,157,161,165
Local AP Wireless working transmission power	0（Ordinary power） 1（Enhanced power）
VLAN ID	0-255，Feature is not enabled;

5.7 Response confirmation content(X3X3)"packet content"

Response confirmation packet content structure	
Query response confirmation content	Terminator
Original request command name	;&;&

5.7.1 There are several types of response confirmation packets: 6363, 7373, 8383

Respond to requests: 6262, 7272, 8282

5.7.2 After receiving the response confirmation from the request initiator, the device will no longer respond to repeated requests with the same packet ID.

5.7.3 Examples are as follows:

a) Type 8383, packet content: search;&;&

b) Type 7373, packet content: nv_read;&;&

c) Type 6363, packet content: wifi_scan;&;&

5.8 NAK(X4X4)"Packet content"

NAK packet type	NAK packet content structure			
	NAK features	Delimiter	Original command name	Terminator
6464	SPCMD_NAK	;&	***	;&;&
7474	NVRCMD_NAK	;&	nv_read	;&;&
7474	NVWCMD_NAK	;&	nv_write	;&;&

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