Whatsminer API

V2.0.5

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Content

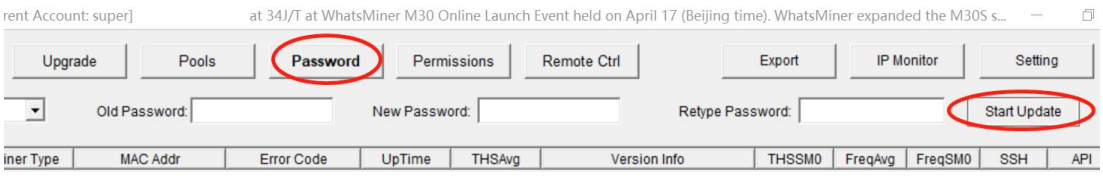
1. Summary

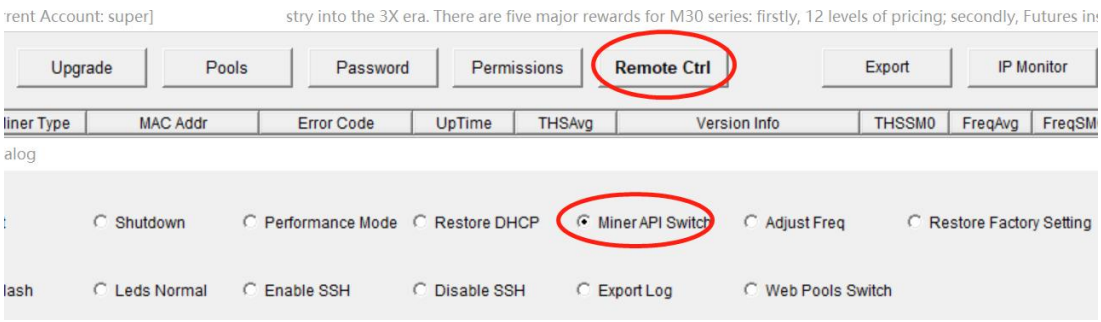
This article describes how to use the whatsminer's API. The intended audience is mine management software developers. The mine management software functions similar to WhatMinerTool can be realized through the API.

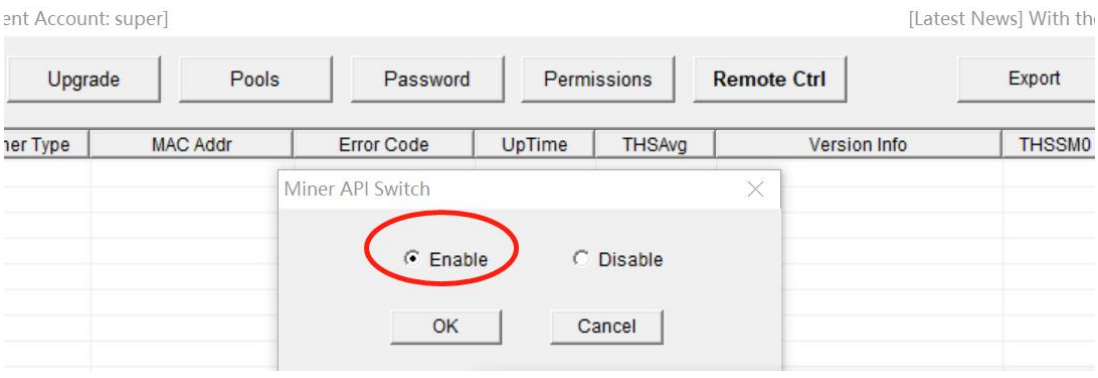
The API read permission is granted by default, and the API write permission needs to be enabled through the WhatMinerTool, follow these steps:

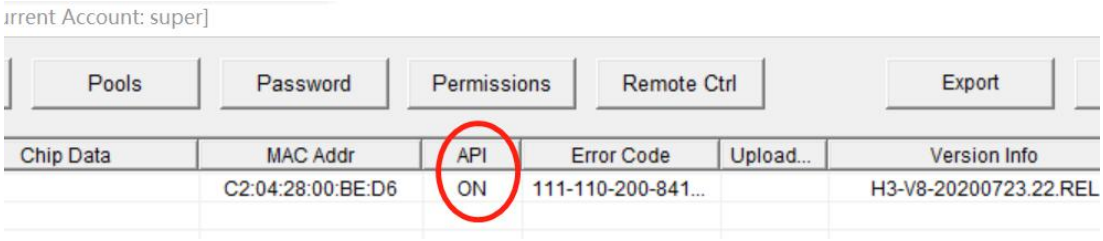
1. Change the default password(admin);

2. Enable the API








urrent Account: super]
Pools
Password
Permissions
Remote Ctrl
Export
Chip Data
MAC Addr
API
Error Code
Upload...
Version Info
C2:04:28:00:BE:D6
ON
111-110-200-841...
H3-V8-20200723.22.REL

2. Protocol

The whatsminer API TCP port is 4028.

Notice:

1. If no data is received within 10 seconds after the port is connected, the connection will time out and be closed.

2. Miner supports max 16 IP clients, one IP can get 32 tokens, and a token keepalive time is 30 minutes.

JSON API return format:

```
{
    "STATUS":"string",
    "When":12345678,                #integer
    "Code":133,
    "Msg":"string",                 #string or object
    "Description":"string",
}
```

Message Code:

Code	Message
14	invalid API command or data
23	invalid JSON message
45	permission denied
131	command OK
132	command error
134	get token message OK

135	check token error
136	token over max times
137	base64 decode error

2.1 API ciphertext

Notice: **the readable API supports two communication modes: plaintext and ciphertext; the writable API supports only ciphertext communication.**

Encryption algorithm:

Ciphertext = aes256(plaintext)，ECB mode

Encode text = base64(ciphertext)

Steps as follows:

(1)api_cmd = token,$sign|api_str

(2)enc_str = aes256(api_cmd, $key)

(3)tran_str = base64(enc_str)

api_str is API command plaintext

Generate aeskey step：

(1)Get token from miner: $time $salt $newsalt

(2)Generate key:

key = md5(salt + admin_password)

Reference code:

key = `openssl passwd -1 -salt $salt "${admin_password}"`

(3)Generate aeskey:

aeskey = sha256($key)

e.g.:

set_led|auto ->

token,$sign|set_led|auto ->

ase256("token,sign|set_led|auto", $aeskey) ->

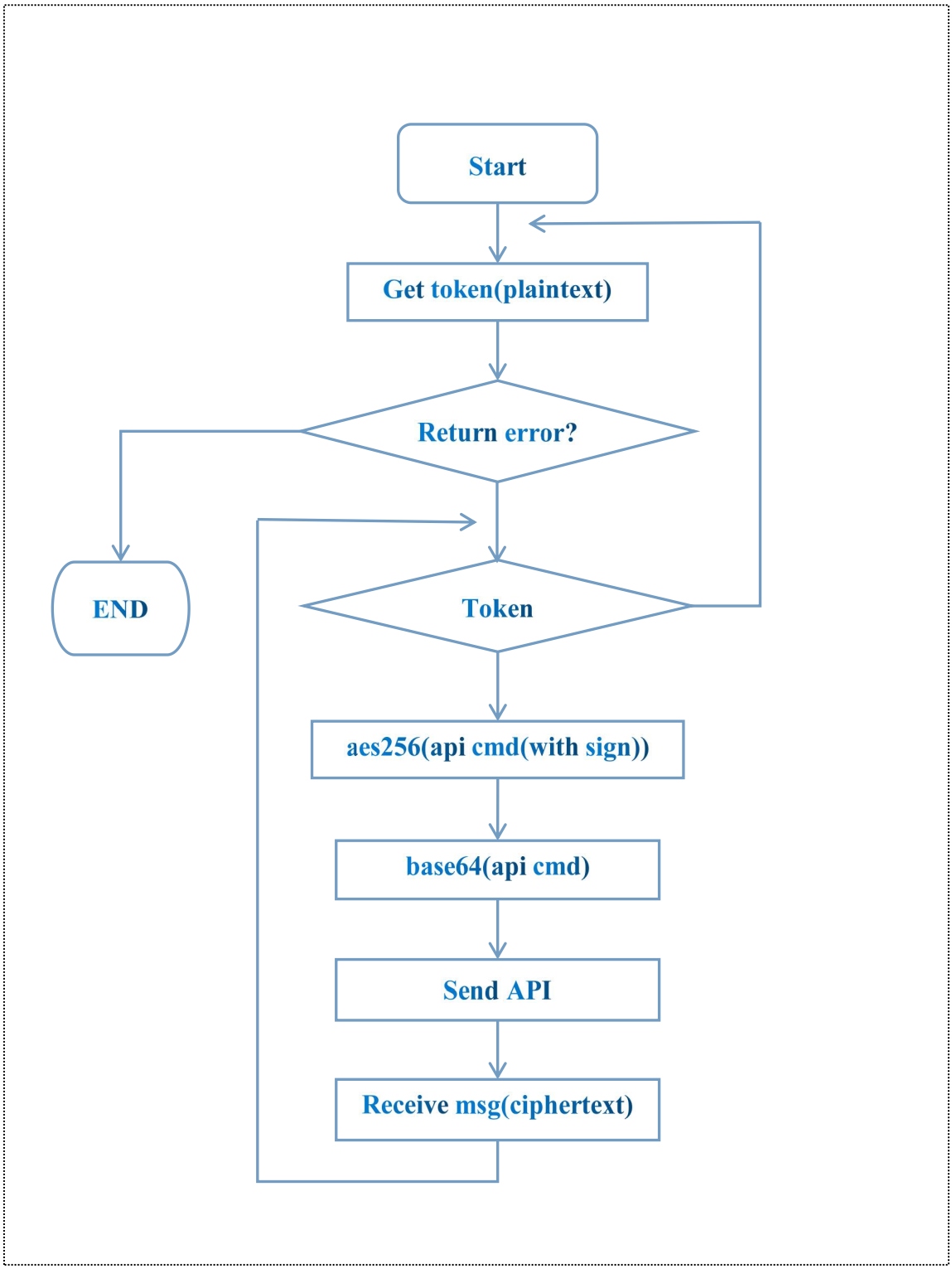
base64(ase256("token,sign|set_led|auto", $aeskey)) ->

enc|base64(ase256("token,sign|set_led|auto", $aeskey))

JSON:

```
{
    "enc":1,          # integer
    "data":"base64 str"
}
```

2.2 The flow


Start
Get token(plaintext)
Return error?
END
Token
aes256(api cmd(with sign))
base64(api cmd)
Send API
Receive msg(ciphertext)

3. Writable API

Writable API only supports ciphertext.

The writable API must first obtain the token as follows:

JSON:

client -> miner：

{"cmd":"get_token"}

miner -> client：

{"time":"str","salt":"str","newsalt":"str"}

e.g.：

{"time":"5626","salt":"BQ5hoXV9","newsalt":"jbzkfQls"}

time: timestamp, this count starts at the Unix Epoch on January 1st, 1970 at UTC.

salt: a random salt is generated for each password

newsalt: new salt for sign

Token calculation method:

Get token from miner: time salt newsalt.

1. calculate key use admin’s password and salt.

2. time is the last four characters of time .

key = **md5**(salt + admin_password)

sign = **md5**(newsalt + key + time)

The reference code in Ubuntu:

First, Get those values from miner: $time $salt $newsalt.

Ubuntu Shell command:

key = `openssl passwd -1 -salt $salt "${admin_password}"|cut -f 4 -d '$'`

sign=`openssl passwd -1 -salt $newsalt "${key}${time:0-4}"|cut -f 4 -d '$'`

The default user name and password are admin

3.1 Update pools information

This operation updates the pool configuration and switches immediately.

JSON:

```
{
    "token":"str",
    "cmd":"update_pools",
    "pool1":"str",
    "worker1":"str",
    "passwd1":"str",
    "pool2":"str",
    "worker2":"str",
    "passwd2":"str",
    "pool3":"str",
    "worker3":"str",
    "passwd3":"str"
}
```

3.2 Restart btminer

This operation only restarts the btminer process, not the control board.

JSON:

```
{
```

```
    "token":"str",
    "cmd":"restart_btminer"
}
```

3.3 Power off hashboard

This operation simply stops mining and turns off the power of the hashboard.

JSON:

```
{
    "token":"str",
    "cmd":"power_off",
}
```

3.4 Power on hashboard

This operation simply starts mining and turns on the power of the hashboard.

JSON:

```
{
    "token":"str",
    "cmd":"power_on",
}
```

3.5 Manage led

Recovery to automatic control:

JSON:

```
{
```

```
    "token":"str",
    "cmd":"set_led",
    "param":"auto"      #The LED flashes in auto mode
}
```

LED manual setting:

```
{
    "token":"str",
    "cmd":"set_led",
    "color":"str",          # str must be "red" or "green"
    "period":integer,       # flash cycle ms
    "duration":integer,     # led on time in cycle(ms)
    "start":integer         # led on time offset in cycle(ms)
}
```

3.6 Switch power mode

After the miner power mode is successfully configured, btminer will be restarted.

JSON:

```
{
    "token":"str",
    "cmd":"set_low_power"
}

{
    "token":"str",
    "cmd":"set_high _power"
}
```

```
{
    "token":"str",
    "cmd":"set_normal _power"
}
```

3.7 Firmware upgrading

Upgrade flow:

Client -> miner(text flow): "update_firmware"

JSON:

```
{
    "token":"str",
    "cmd":"update_firmware"
}
```

Miner -> client(text flow): "ready"

JSON:

```
{
    "STATUS":"S",
    "When":1594179080,
    "Code":131,"Msg":"ready",
    "Description":""
}
```

Client -> miner(binary flow): file_size(4Bytes) file_data

file_size: size of upgrade file,send integer to stream as little endian.

file_data:file binary flow

Check upgrading by the value of "Firmware Version" returned by summary.

All interactions are one-time TCP connections.

3.8 Reboot system

This operation restarts the control board.

JSON:

```
{
    "token":"str",
    "cmd":"reboot"
}
```

3.9 Restore to factory setting

This operation restores the network configuration, system passwords, user permission, turns off the api switch, web pools set, removes pools, power mode, power limit, etc.

JSON:

```
{
    "token":"str",
    "cmd":"factory_reset"
}
```

3.10 Modify the password of admin account

The maximum password length is 8 bytes.

Notice: the token must be acquired again from miner for encrypted transmission.

JSON:

```
{
    "token":"str",
    "cmd":"update_pwd",
    "old":"str",                    # use letter,number,underline
    "new":"str"                     # use letter,number,underline
}
```

3.11 Modify network configuration

Notice: **after modifying the configuration, miner will restart.**

JSON:

```
{
    "token":"str",
    "cmd":"net_config",
    "param":"dhcp"
}
```

JSON:

```
{
    "token":"str",
    "cmd":"net_config",
    "ip":"str",
    "mask":"str",
    "gate":"str",
    "dns":"str",            # e.g.: "114.114.114.114 192.168.0.1" , divide by space
    "host":"str"
}
```

3.12 Download logs

This operation exports the miner log files.

Download flow:

Client -> miner(text flow):

JSON:

```
{
    "token":"str",
    "cmd":"download_logs"
}
```

Miner -> client(text flow):

JSON:

```
{
    "STATUS":"S",
    "When":1603280777,
    "Code":131,
    "Msg":{"logfilelen":"str"},
    "Description":""
}
```

Miner -> client(binary flow):

The miner sends the file contents after 10ms delay.

3.13 Set target frequency

Set a new target mining frequency, which adjusts a certain percentage based on the mining frequency in normal power mode (a percentage of 0 means no adjustment). Please note that only water-cooled and liquid-cooled machines support overclocking, while fan-cooled machines only support underclocking. After successful setting, the mining service will automatically restart.

JSON:

```
{
    "cmd": "set_target_freq",
    "percent": "str",                    #range: -100 ~ 100
    "token": "str"
}
```

3.14 Enable btminer fast boot

After setting, the next restart of the miner takes effect.

JSON:

```
{
    "cmd": "enable_btminer_fast_boot",
    "token": "str"
}
```

3.15 Disable btminer fast boot

After setting, the next restart of the miner takes effect.

JSON:

```
{
    "cmd": "disable_btminer_fast_boot",
    "token": "str"
}
```

3.16 Enable web pools

Allows configuration of pools on web pages with immediate effect.

JSON:

```
{
    "cmd": "enable_web_pools",
    "token": "str"
}
```

3.17 Disable web pools

Turn off the configure pools feature on the web page with immediate effect.

JSON:

```
{
    "cmd": "disable_web_pools",
    "token": "str"
}
```

3.18 Set hostname

This configuration does not take effect until the network is restarted.

JSON:

```
{
    "cmd": "set_hostname",
    "hostname": "str",
    "token": "str"
}
```

3.19 Set zone

This configuration does not take effect until the network is restarted.

JSON:

```
{
    "cmd": "set_zone",
    "timezone": "CST-8",
    "zonename": "Asia/Shanghai",
    "token": "str"
}
```

3.20 Load log

Configure the rsyslog log server.

JSON:

```
{
    "cmd": "load_log",
    "ip": "str",
    "port": "str",
    "proto": "str",              #tcp/udp
    "token": "str"
}
```

3.21 Set power percent (Fast mode)

The dynamic adjustment of the power percentage is based on the initial stable mining power. The adjustment process is completed within one second. Please note that only an approximate power percentage can be achieved, and the lowest percentage that can maintain stable operation is related to the machine's own characteristics, environmental temperature, and cooling conditions. If the target percentage is too low, it may cause the machine to become unbalanced and automatically restart the mining service. The maximum percentage cannot exceed 100%. This is recommended for temporary adjustments only, as running for extended periods may lead to instability. Compared to

Set power percent V2 (Normal mode), it is faster in adjusting power percentage, however, it comes with a greater loss in performance. If speed of adjustment is not a priority, it is recommended to use Set power percent V2 (Normal mode).

JSON:

```
{
    "cmd": "set_power_pct",
    "percent": "str",                #range: 0 ~ 100
    "token": "str"
}
```

3.22 Set power percent V2 (Normal mode)

The dynamic adjustment of power percentage is based on the initial stable mining power. This adjustment process will last for a few minutes and may result in a slight but not significant loss in hash rate. Please note that only an approximate power percentage can be achieved, and the lowest percentage that can maintain stable operation is related to the machine's own characteristics, environmental temperature, and cooling conditions. If the target percentage is too low, it may cause the machine to become unbalanced and automatically restart the mining service. This function is only permitted for fan-cooled machines in normal or low power mode; there are no power mode restrictions for water-cooled and liquid-cooled machines. The maximum percentage cannot exceed 100% (future versions will allow water-cooled and liquid-cooled machines to exceed 100%). Although its impact on performance is less than that of Set power percent (Fast mode), the machine is still not in its optimal state in terms of performance and stability. It is suitable for scenarios where power costs frequently change and power adjustments are constantly required. If there is no need for frequent power adjustments and long-term operation at a specific power level is preferred, it is recommended to use Adjust power limit or Set target frequency.

JSON:

```
{
    "cmd": "set_power_pct_v2",
    "percent": "str",                #range: 0 ~ 100
    "token": "str"
}
```

3.23 Pre power on

The miner can be preheated by "pre_power_on" before "power on", so that the machine can quickly enter the full power state when "power on" is used. You can also use this command to query the pre power on status. Make sure power_off btminer before pre_power_on.

"wait for adjust temp": The temperature adjustment of the miner is not completed.

"adjust complete": The temperature adjustment of the miner is completed, and miner can be power on.

"adjust continue": Miner is adjusting the temperature while waiting to end.

The value of "complete" is true after the temperature adjustment is complete.

JSON:

```
{
    "cmd": "pre_power_on",
    "complete": "str",              #true/false
    "msg": "str",          #"wait for adjust temp"/"adjust complete"/"adjust continue"
    "token": "str"
}
```

3.24 Set temp offset

Set the offset of miner hash board target temperature.

JSON:

```
{
    "cmd": "set_temp_offset",
    "temp_offset": "str",               #range: -30 ~ 0
    "token": "str"
}
```

3.25 Adjust power limit

Set the upper limit of the miner's power. Not higher than the ordinary power of the machine. If the Settings take effect, the machine will restart.

JSON:

```
{
    "cmd": "adjust_power_limit",
    "power_limit": "str",                #range: 0 ~ 99999
    "token": "str"
}
```

3.26 Adjust upfreq speed

Set the upfreq speed, 0 is the normal speed, 9 is the fastest speed.

The faster the speed, the greater the final hash rate and power deviation, and the stability may have a certain impact. Fast boot mode cannot be used at the same time.

JSON:

```
{
    "cmd": "adjust_upfreq_speed",
    "upfreq_speed": "str",               #range: 0 ~ 9
    "token": "str"
}
```

3.27 Set poweroff cool

Set whether to cool machine when stopping mining.

JSON:

```
{
    "cmd": "set_poweroff_cool",
```

```
    "poweroff_cool": "str",              #type: bool, range: [0,1]
    "token": "str"
}
```

3.28 Set fan zero speed

Sets whether the fan speed supports the lowest 0 speed.

JSON:

```
{
    "cmd": "set_fan_zero_speed",
    "fan_zero_speed": "str",             #type: bool, range: [0,1]
    "token": "str"
}
```

4. Readable API

4.1 Summary

Contains fan speed, power info, etc.

JSON:

```
{
    "cmd":"summary"
}
```

Return:

```
{
    "STATUS":[{"STATUS":"S","Msg":"Summary"}],
    "SUMMARY":
    [
        {
        "Elapsed":2648,
        "MHS av":84983730.62,                    #Average hash rate of miner(MHS)
        "MHS 5s":102423869.64,
        "MHS 1m":86361423.06,
        "MHS 5m":84941366.02,
        "MHS 15m":84969424.09,
        "HS RT":84941366.02,
        "Accepted":804,
        "Rejected":0,
        "Total MH":225043191209.0000,
        "Temperature":80.00,
        "freq_avg":646,
        "Fan Speed In":4530,                     #Air outlet fan speed(RPM)
        "Fan Speed Out":4530,                    #Air inlet Fan speed(RPM)
        "Power":3593,                            #Input power(W)
        "Power Rate":42.31,
```

```
            "Pool Rejected%":0.0000,
            "Pool Stale%":0.0000,
            "Last getwork":0,
            "Uptime":20507,                    #System up time(second)
            "Security Mode":0,
            "Hash Stable":true,
            "Hash Stable Cost Seconds":17569,
            "Hash Deviation%":0.1398,
            "Target Freq":574,
            "Target MHS":76157172,
            "Env Temp":32.00,
            "Power Mode":"Normal",             #Power mode (Low/Normal/High)
            "Factory GHS":84773,               #Factory hash rate(GHS)
            "Power Limit":3600,
            "Chip Temp Min":75.17,
            "Chip Temp Max":101.25,
            "Chip Temp Avg":89.60,
            "Debug":"-0.0_100.0_354",
            "Btminer Fast Boot":"disable"
            }
    ]
}
```

4.2 Pools

Contains pool miner information.

JSON:

```
{
    "cmd":"pools"
}
```

Return:


```
{
    "STATUS":[{"STATUS":"S","Msg":"1 Pool(s)"}],
    "POOLS":
    [
        {
        "POOL":1,
        "URL":"stratum+tcp://btc.ss.poolin.com:443",    #Pool address and port
        "Status":"Alive",                   #Pool status
        "Priority":0,                       #Pool priority(0 highest)
        "Quota":1,                          #Pool default strategy is 1
        "Long Poll":"N",
        "Getworks":1,
        "Accepted":0,                       #Accepted nonces by the pool
        "Rejected":0,                       #Rejected nonces by the pool
        "Works":0,
        "Discarded":0,
        "Stale":0,
        "Get Failures":0,
        "Remote Failures":0,
        "User":"microbtinitial",                #Miner name
        "Last Share Time":0,                    #Last nonce submission time
        "Diff1 Shares":0,
        "Proxy Type":"",
        "Proxy":"",
        "Difficulty Accepted":0.00000000,
        "Difficulty Rejected":0.00000000,
        "Difficulty Stale":0.00000000,
        "Last Share Difficulty":0.00000000,
        "Work Difficulty":0.00000000,
        "Has Stratum":1,
        "Stratum Active":true,                      #Pool stratum status
        "Stratum URL":"btc-vip-3dcoa7jxu.ss.poolin.com",    #Pool address
```

```
            "Stratum Difficulty":65536.00000000,          #Pool difficulty
            "Best Share":0,
            "Pool Rejected%":0.0000,                      #Pool rejection percent
            "Pool Stale%":0.0000,
            "Bad Work":0,
            "Current Block Height":0,                     #Current Block Height
            "Current Block Version":536870916             #Current Block Version
            }
    ]
}
```

4.3 Edevs/devs

Contains information for each hash board.

JSON:

```
{
    "cmd":"edevs"
}
```

Return:

```
{
    "STATUS":[{"STATUS":"S","Msg":"3 ASC(s)"}],
    "DEVS":
    [
            {
            "ASC":0,
            "Slot":0,                          #Hash board slot number
            "Enabled":"Y",
            "Status":"Alive",
            "Temperature":80.00,               #Board temperature at air outlet (℃)
```

```
            "Chip Frequency":587,              #Average frequency of chips in hash board
(MHz)
            "MHS av":10342284.80,              #Average hash rate of hash board (MHS)
            "MHS 5s":5298845.66,
            "MHS 1m":8508905.30,
            "MHS 5m":10351110.56,
            "MHS 15m":10296867.74,
            "HS RT":10351110.56,
            "HS Factory":28836,                #Factory marking(GHS)
            "Accepted":18,
            "Rejected":0,
            "Last Valid Work":1643183296,
            "Upfreq Complete":0,
            "Effective Chips":156,
            "PCB SN":"HEM1EP9C400929K60003",       #PCB serial number
            "Chip Data":"K88Z347-2039      BINV01-195001D",
            "Chip Temp Min":80.56,
            "Chip Temp Max":97.00,
            "Chip Temp Avg":89.89,
            "chip_vol_diff":9
            },
            {
            "ASC":1,
            "Slot":1,
            "Enabled":"Y",
            "Status":"Alive",
            "Temperature":80.00,
            "Chip Frequency":590,
            "MHS av":10259948.84,
            "MHS 5s":5413853.90,
            "MHS 1m":8577249.68,
            "MHS 5m":10441143.92,
            "MHS 15m":10214893.36,
```

```
"HS RT":10441143.92,
"Accepted":16,
"Rejected":0,
"Last Valid Work":1643183291,
"Upfreq Complete":0,
"Effective Chips":156,
"PCB SN":"HEM1EP9C400929K60001",
"Chip Data":"K88Z347-2039      BINV01-195001D",
"Chip Temp Min":77.94,
"Chip Temp Max":96.50,
"Chip Temp Avg":88.23,
"chip_vol_diff":9
},
{
"ASC":2,
"Slot":2,
"Enabled":"Y",
"Status":"Alive",
"Temperature":80.00,
"Chip Frequency":590,
"MHS av":10258829.89,
"MHS 5s":5571781.71,
"MHS 1m":8675316.17,
"MHS 5m":10479953.41,
"MHS 15m":10213779.32,
"HS RT":10479953.41,
"Accepted":19,
"Rejected":0,
"Last Valid Work":1643183296,
"Upfreq Complete":0,
"Effective Chips":156,
"PCB SN":"HEM1EP9C400929K60002",
"Chip Data":"K88Z347-2039      BINV01-195001D",
```

```
            "Chip Temp Min":80.50,
            "Chip Temp Max":97.44,
            "Chip Temp Avg":90.91,
            "chip_vol_diff":9
            }
    ]
}
```

4.4 Devdetails

JSON:

```
{
    "cmd":"devdetails"
}
```

Return:

```
{
    "STATUS":
    [
            {
            "STATUS":"S",
            "When":1643181852,
            "Code":69,
            "Msg":"Device Details",
            "Description":"btminer"
            }
     ],
    "DEVDETAILS":          #Hashboard detail
    [
            {
```

```
            "DEVDETAILS":0,
            "Name":"SM",
            "ID":0,
            "Driver":"bitmicro",
            "Kernel":"",
            "Model":"M30S+VE40"
            },
            {
            "DEVDETAILS":1,
            "Name":"SM",
            "ID":1,
            "Driver":"bitmicro",
            "Kernel":"",
            "Model":"M30S+VE40"
            },
            {
            "DEVDETAILS":2,
            "Name":"SM",
            "ID":2,
            "Driver":"bitmicro",
            "Kernel":"",
            "Model":"M30S+VE40"
            }
    ]
}
```

4.5 Get PSU

Contains power information.

JSON:

```
{
```

```
    "cmd":"get_psu"
}
```

Return:

```
{
    "STATUS":"S",
    "When":1643182793,
    "Code":131,
    "Msg":
    {
        "name":"P221B",
        "hw_version":"V01.00",
        "sw_version":"V01.00.V01.03",
        "model":"P221B",
        "iin":"8718",                    #Current in
        "vin":"22400",                   #Voltage in
        "fan_speed":"6976",              #Power fan speed
        "version":"-1",
        "serial_no":"A1232B0120100049",
        "vendor":"7",
        "temp0":"33.5"                   #Temperature of power (Celsius degree)
    },
    "Description":""
}
```

4.6 Get version

Get miner API version.

JSON:

```
{
```

```
    "cmd":"get_version"
}
```

Return:

```
{
    "STATUS":"S",
    "When":1643187652,
    "Code":131,
    "Msg":
    {
        "api_ver":"2.0.3",
        "fw_ver":"20220125.13.Rel",
        "platform":"H6OS",
        "chip":"K88Z001-2039      BINV01-195001B"
    },
    "Description":""
}
```

4.7 Get token

Plaintext must be used, and the miner returns plaintext.

JSON:

```
{
    "cmd":"get_token"
}
```

Return:

```
{
    "STATUS":"string",
    "When":12345678,
```

```
    "Code":133,
    "Msg":
    {
        "time":"str",
        "salt":"str",
        "newsalt":"str"
    },
    "Description":""
}
```

4.8 Status

Get btminer status and firmware version.

JSON:

```
{
    "cmd":"status"
}
```

Return:

```
{
    "btmineroff":"str",                    #"true"/"false"
    "Firmware Version":"str",
    "power_mode":"str",
    "hash_percent":"str"                   #changed by set_target_freq
}
```

4.9 Get miner info

JSON:

```
{
    "cmd":"get_miner_info",
    "info":"ip,proto,netmask,gateway,dns,hostname,mac,ledstat,minersn,powersn"
}
```

You can select the fields in "info" that you want to return.

Return:

```
{
    "STATUS":"S",
    "When":1618212903,
    "Code":131,
    "Msg":
    {
        "ip":"192:168:2:16",
        "proto":"dhcp",
        "netmask":"255.255.255.0",
        "dns":"114.114.114.114",
        "mac":"C6:07:20:00:1E:C2",
        "ledstat":"auto",
        "gateway":"192.168.2.1",
        "minersn":"str",
        "powersn":"str"
    },
    "Description":""
}
```

4.10 Get error code

You can use this command to obtain the machine error codes.

JSON:

```
{
    "cmd":"get_error_code",
}
```

Return:

```
{
    "STATUS":"S",
    "When":1642392343,
    "Code":131,
    "Msg":{"error_code":["329":"2022-01-17 11:28:11"]},
    "Description":""
}
```

The API command can be used for two joins.

e.g.

```
{
    "cmd":"summary+pools"
}
```