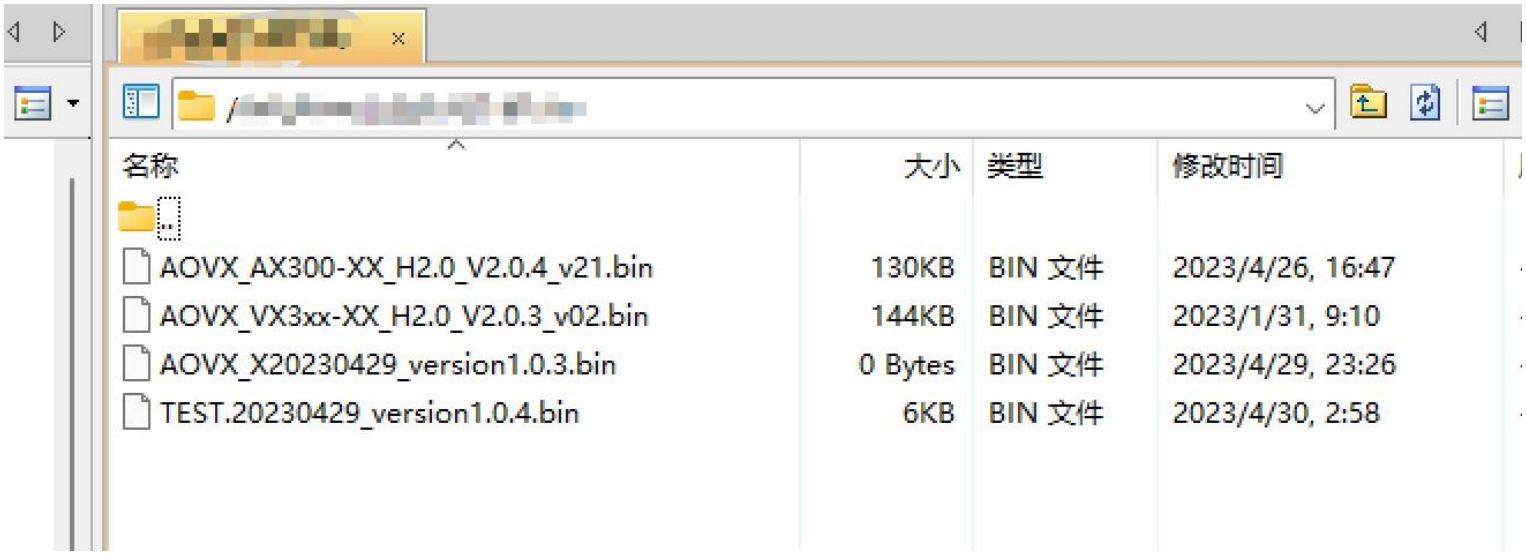
1.Upload firmware to server

Upload the firmware to be upgraded to a directory on the server based on the corresponding operating system of the server.

Taking Ubuntu as an example, I used xFTP to upload the firmware to be upgraded to my server.



2.Generate firmware URL

We can install NGINX and generate firmware URL.

Execute the following script to install Nginx on the Ubuntu server.

```
apt-get install nginx
```

After Nginx installation is completed, we need to configure the firmware resource directory.

For example, we create a downloadconf file in the /etc/nginx/conf.d directory, which contains the following settings:

```
autoindex on; #Open file directory previewautoindex_exact_size on;autoindex_localtime on;charset utf-8;

server {
```

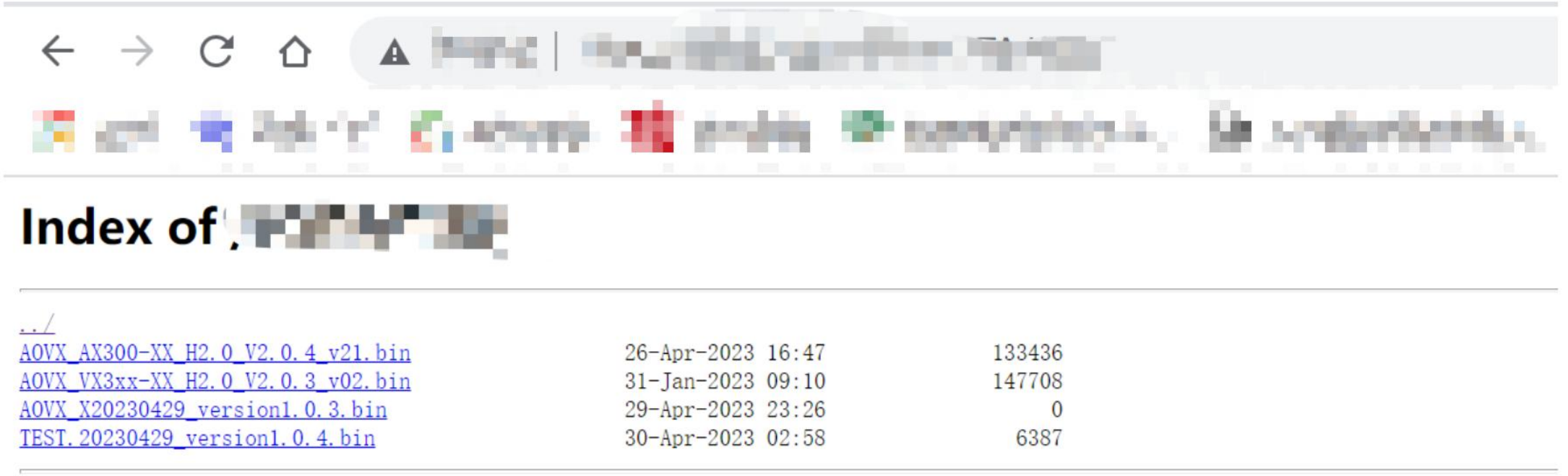
```
    listen 8888;

    server_name download;

    root /opt/download; #Firmware File Resource Directory

}
```

Finally, we can see the file url of the firmware on the server through the browser. The complete URL of the upgrade package corresponding to the command provided to the device below this url.



3.Send upgrade command to devices

The upgrade command message ID of the device is 0x8105, and the corresponding command word is 32.

Device Control(0x8105)

Flag	Message ID		Properties of Message Body		Device Number						Message Sequence Number		Command Word	Command Parameters		Checksum Code	Flag
HEX (1 byte)	HEX (2 bytes)		HEX (2 bytes)		HEX (6 bytes)						HEX (2 bytes)		HEX (1 byte)	HEX (n byte)		HEX (1 byte)	HEX (1 byte)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
0x7E	0x81	0x05	0x00	0x0F	0x22	0x10	0x42	0x21	0x43	0x28	0x00	0x01	0x0C	0x00	0x01	0x3F	0x7E

Restore factory settings	5	/	GAV	
OTA upgrade	32	TYPE; MODE; VERSION; PROTOCOL; URL; MD5	GAV	TYPE:0:app upgrade,1: core upgrade MODE:0:full package,1: diff package VERSION:preupgrade version PROTOCOL:0: FTP protocol,1: HTTP protocol URL:The full URL connection used for the actual upgrade MD5:The MD5 value of firmware
Fuel control	33	MODE	V	MODE:0:connect 1:disconnect
Power out control	34	MODE	V	MODE:0:off 1:on
GPIO output	35	CHANNEL;MODE	V	GPIO Output, CHANNEL: 0-15 MODE:0:off 1:on
Transparent transmission AT	36	Command	GAV	COMMAND: refer to AT command

Command Example：

```
7E81050094413050959369000120303B303B687474703A2F2F3132342E3232332E36302E3233343A383838382F464F54412F3130302F414F56585F41583330302D58585F48322E305F56322E302E345F7632312E62696E3B313B687474703A2F2F3132372E302E302E313A383838382F464F54412F3130302F414F56585F4158333330302D58585F48322E305F56322E302E345F7632312E62696E3B313233343536407E
```

Example Description：

```
7E -->Start Flag

8105 -->Messgae Id 0x8105

006C -->Message Body Properties

413050959369 -->Device S/N

0001 -->Serial number

20 -->This is the hexadecimal command word, corresponding to the decimal command word of 32.
```

```
30 3B -->Convert 30 to an ASCII string of "0", which corresponds to TYPE: 0 for app upgrade, 1 for core upgrade; The ASCII string corresponding to 3B is ";", which corresponds to the separator character.

30 3B -->Convert 30 to an ASCII string of "0", which corresponds to MODE: 0 represents the full package, and 1 represents the differential package; The ASCII string corresponding to 3B is ";", which corresponds to the separator character.

414F56585F41583330302D58585F48322E305F56322E302E345F763231 3B -->414F56585F41583330302D58585F48322E305F56322E302E345F763231 is the hexadecimal string with the version,value is:"AOVX_AX300-XX_H2.0_V2.0.4_v21";The ASCII string corresponding to 3B is ";", which corresponds to the separator character.

31 3B -->Convert 31 to an ASCII string of "1",which corresponds to PROTOCOL:0 represents the FTP protocol, 1 represents the HTTP protocol;The ASCII string corresponding to 3B is ";", which corresponds to the separator character.

687474703A2F2F3132372E302E302E313A383838382F464F54412F3130302F414F56585F41583330302D58585F48322E305F56322E302E345F7632312E62696E
 3B -->687474703A2F2F3132372E302E302E313A383838382F464F54412F3130302F414F56585F41583330302D58585F48322E305F56322E302E345F7632312E62696E  is the hexadecimal string of the firmware URL, value is:" http://127.0.0.1:8888/FOTA/100/AOVX_AX300 -XX_ H2.0_ V2.0.4_ v21.bin";The ASCII string corresponding to 3B is ";", which corresponds to the separator character.

313233343536 -->The value of MD5 key defaults to 123456

F0 -->Check Code

7E -->End Flag
```

4.Device responds to upgrade command

After sending the upgrade command, the device will respond with 0x0001, indicating that the device has received the upgrade task.

Afterwards, the device will provide the upgrade progress and whether the upgrade has been completed based on the data type in the 0xF6 extension message of 0x0002.

Trigger Type and Sensors Information

HEX
(2+1+1+m*([2]+[2]+[2]+[6]+[10]+[2]+[2]+[2]) bytes)

149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173
0x00	0xF6	0x1E	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00	0x00

Sensors information [Light,Temperature,Humidity,Accelerometer,Limit (Light,Tmax,Tmin,Hmax,Hmin),Res1,Res2,Res3]
Light: 2 bytes
Temperature: 2 bytes
Humidity: 2 bytes
Accelerometer: 6 bytes
Limit(Light,Tmax,Tmin,Hmax,Hmin): 10 bytes
Res1: 2 bytes
Res2: 2 bytes
Res3: 2 bytes

The field mask bit 0-7 identifies [Light,Temperature,Humidity,Accelerometer,Limit,Res1,Res2,Res3]

Data type(0-63 is for GA series, 64-255 is for V series):
G/A series:
0:periodic sampling 1:low battery trigger 2:motion trigger 3:crash trigger 4:light trigger 5:humi&temp trigger 6:temperature trigger 7:humidity trigger 8:clock trigger 9:BT continuous trigger
V series:
64:periodic trigger 65:power on trigger 66:ACC ignition 67:ACC flameout 68:VCC connect 69:VCC remove 70:virtual ignition(Gsensor) 71:virtual ignition(GNSSAST)
72:virtual flameout(Gsensor) 73:corner trigger 74:overspeed trigger 75:OTA start 76:OTA succeed 77:OTA failed 78:GNSS first fixed 79: low voltage trigger 80: low voltage release
81:Jamming trigger 82: distance trigger 83:crash trigger 84:DI1 trigger 85:DI2 trigger 86:DI3 trigger 87:DI4 trigger 88:DI5 trigger 89:DI6 trigger
90:DI7 trigger 91:DI8 trigger 92:DI9 trigger 93:DI10 trigger 94:AI upper limit trigger 95:AI lower limit trigger 96:battery low voltage trigger 97:battery low voltage release
98:battery start charging 99:battery full charged 100:soft reset trigger 101:virtual ignition(voltage) 102:virtual flameout(voltage) 103:TOW start 104:TOW stop 105: enter GEO-Fence 106: exit GEO-Fence 107:WAKEUP
108:DI1_UP 109:SPEED_U 110: SPEED_D 111: SPEED_T 112: ACCELER

Additional information length