WEBCLIENT User Manual

RT-THREAD Document Center

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2013-05-05	v1.0.0	bernard	Initial version
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Chapter 1

Software Package Introduction

The WebClient software package is independently developed by RT-Thread and is based on the implementation of the HTTP protocol client. Provides basic functions for communication between the device and HTTP Server.

1.1 Software Package Directory Structure

The directory structure of the WebClient package is as follows:

```
webclient
+---docs
 ÿ +---figures ÿ ÿ api.md                      // Document using images
 ÿ ÿ introduction.md ÿ                         // API usage instructions
 ÿ principle.md ÿ ÿ README.md ÿ ÿ              // Introduction document
 samples.md ÿ ÿ user-guide.md                  // Implementation principle
 ÿ +---version.md                              // Document structure description
                                               // Package example
                                               // Instructions
                                               // Edition
+---inc                                        // Header file
+---src                                        // Source file
+---samples ÿ ÿ                                // Example code
 webclient_get_sample ÿ +---                   // GET request example code
 webclient_post_sample ÿ ÿ README.md +---      // POST request example code
        LICENSE                                // Package License
 SConscript                                    // Software package instructions
                                               //RT-Thread default build script
```

1.2 Software Package Features

WebClient software package features:

- Support IPV4/IPV6 addresses

  The WebClient package will automatically determine whether the incoming URI address is an IPV4 address or an IPV6 address based on its format, and parse the information needed to connect to the server, thereby improving code compatibility.

- Support GET/POST request methods

  HTTP has multiple request methods (GET, POST, PUT, DELETE, etc.). Currently, the WebClient package supports GET and POST request methods, which are also the two most commonly used command types in embedded devices, meeting device development requirements.

- Support file upload and download functions

  The WebClient package provides file upload and download interface functions, allowing users to directly upload local files to the server or download server files to the local computer through GET/POST request methods. File operations require file system support, so the file system must be enabled and ported before use.

- Support HTTPS encrypted transmission

  The HTTPS protocol (HyperText Transfer Protocol over Secure Socket Layer) is based on TCP, just like the HTTP protocol. It actually adds a layer of TLS encryption encapsulation to the original HTTP data to achieve the purpose of encrypted data transmission. The HTTPS protocol address is different from the HTTP address and begins with https . The TLS encryption method in the WebClient package relies on the mbedtls package. accomplish.

- Complete header data adding and processing methods

  HTTP headers are used to identify the data and status of the current request or response. When sending GET/POST requests, header assembly presents a significant challenge for users. Conventional approaches involve manually entering headers line by line or using string concatenation. The WebClient package provides a simple method for adding and sending request headers, making it easier for users to do so. For headers returned by a request, users often need to retrieve the header field data. The WebClient package also provides a method for retrieving field data by field name, making it easy to retrieve the required data.

1.3 Introduction to HTTP Protocol

1.3.1 Brief Introduction to HTTP Protocol

HTTP (Hypertext Transfer Protocol) is the most widely used network protocol on the Internet. Due to its simple and fast method, it is suitable for distributed and collaborative hypermedia information systems.

HTTP is a network application layer protocol based on TCP/IP. The default port is 80. The latest version is HTTP 2.0, while HTTP 1.1 is the most widely used.

HTTP is a request/response protocol. After a client establishes a connection with a server, it sends a request to the server. Upon receiving the request, the server determines the appropriate response based on the information it receives and responds accordingly to the client, completing the entire HTTP data exchange process.

Browser web pages are the main application of HTTP, but this does not mean that HTTP can only be applied to web pages. In fact, as long as both parties in communication follow the HTTP protocol and the data transmission is appropriate, data interaction can be carried out. For example, embedded devices connect to the server through the HTTP protocol.

1.3.2 HTTP Protocol Characteristics

- Stateless protocol

  HTTP is a stateless protocol. Statelessness means the protocol has no memory of events. This means that if subsequent processing requires previous information, it must be retransmitted, potentially increasing the amount of data transmitted per connection. However, this allows the server to respond more quickly when it no longer needs previous information.

- Flexible data transmission

  HTTP allows the transmission of any type of data object, and the type of data transmitted is marked and distinguished by Content-Type.

- Simple and fast

  When a client sends a request to a server, it only needs to transmit the request method and path. Due to the simplicity of the HTTP protocol, the HTTP server program size is small, and thus the communication speed is very fast.

- Support B/S and C/S modes

  C/S structure, namely Client/Server structure. B/S structure, namely Browser/Server structure.

1.3.3 HTTP Request

The request message sent by the client to the server for an HTTP request consists of four parts: request line, request header, blank line and request data.

- Request line: used to describe the request type, the resource to be accessed, and the HTTP used.

  Version;

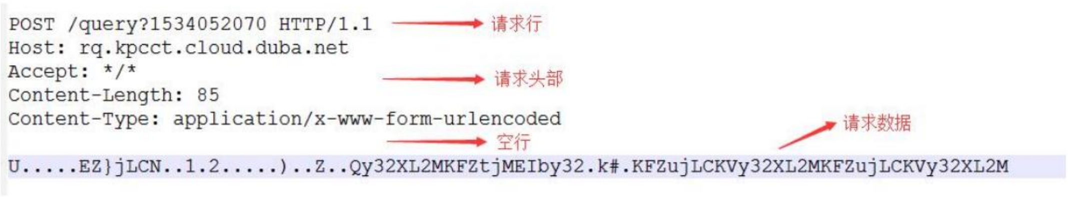
- Request header: The part immediately following the request line (i.e. the first line) that describes the additional information the server will use.

  breath;

- Blank line: The blank line after the request header is required to distinguish the header from the request data;

- Request data: Request data is also called the body, and any other data can be added.

The following figure shows the information of a POST request:



```
POST /query?1534052070 HTTP/1.1
Host: rq.kpcct.cloud.duba.net
Accept: */*
Content-Length: 85
Content-Type: application/x-www-form-urlencoded

U.....EZ}jLCN..1.2.....)..Z..Qy32XL2MKFZtjMEIby32.k#.KFZujLCKVy32XL2MKFZujLCKVy32XL2M
```

Figure 1.1: *HTTP* Protocol request information

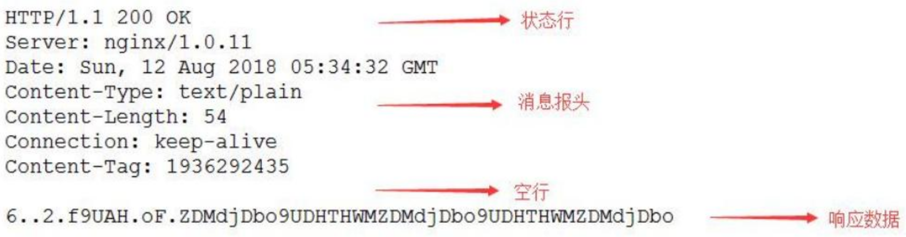
1.3.4 HTTP Response

Generally speaking, after receiving and processing the request sent by the client, the server will return an HTTP response message.

HTTP response also consists of four parts: status line, message header, blank line and response data.

- Status line: consists of HTTP protocol number (HTTP 1.1), response status code (200), and status information (OK) composition;
- Message header: used to indicate some additional information to be used by the client (date, data length, etc.);
- Blank line: The blank line after the message header is required and is used to distinguish the message header from the response data;
- Response data: text information returned by the server to the client.

The following figure shows the response information of a POST request:



```
HTTP/1.1 200 OK
Server: nginx/1.0.11
Date: Sun, 12 Aug 2018 05:34:32 GMT
Content-Type: text/plain
Content-Length: 54
Connection: keep-alive
Content-Tag: 1936292435

6..2.f9UAH.oF.ZDMdjDbo9UDHTHWMZDMdjDbo9UDHTHWMZDMdjDbo
```

Figure 1.2: *HTTP* Protocol response information

1.3.5 HTTP Status Codes

The HTTP protocol uses the returned status code to determine the current response status. The WebClient package also has How to obtain and judge the status. Here we mainly introduce the meaning of common status codes.

The status code consists of three digits. The first digit defines the category of the response. There are five categories:

- 1xx: Indication – indicates the request has been received and continues to be processed
- 2xx: Success – Indicates that the request was successfully received, understood, and accepted
- 3xx: Redirect – Further action is required to complete the request
- 4xx: Client Error – The request had a syntax error or could not be fulfilled
- 5xx: Server Error – The server failed to fulfill a valid request

Common status codes are as follows:

```
200 OK                          //Client request successful
206 Partial Content             //The server has successfully processed some GET requests
400 Bad Request                 //The client request has a syntax error and cannot be understood by the server
403 Forbidden                   //The server received the request, but refused to provide service
404 Not Found                   //The requested resource does not exist, e.g., an incorrect URL was entered
500 Internal Server Error       //An unexpected error occurred on the server
503 Server Unavailable          //The server cannot currently process the client's request
```

Chapter 2

Sample Program

The WebClient package provides two HTTP Client sample programs, which are used to demonstrate the GET and

And POST functions to complete data upload and download.

Sample File

Sample program path	illustrate
samples/webclient_get_sample.c	GET request test routine
samples/webclient_post_sample.c	POST request test routine

2.1 Preparation

2.1.1 Obtaining the Software Package

- menuconfig configuration to obtain software packages and sample code

Open the ENV tool provided by RT-Thread and use **menuconfig** to configure the software package.

Enable the WebClient package and configure the Enable webclient GET/POST samples test routine as shown below:

```
RT-Thread online packages
    IoT - internet of things --->
        [*] WebClient: A HTTP/HTTPS Client for RT-Thread
        [ ] Enable support tls protocol
        [*] Enable webclient GET/POST samples # Enable WebClient test routines # Enable the use of the
            Version (latest) --->                          latest version of the software package
```

• Use the pkgs --update command to download the software package •
Compile and download

2.2 Startup routine

The test website used in this example is the official website of the RT-Thread system. The GET request example retrieves and prints the contents of a file from the website; the POST request example uploads data to the test website, which responds with the same data.

HTTP data sent and received consists of two parts: header data and body data. Hereinafter, header data is referred to as header data and body data is referred to as body data.

2.2.1 GET Request Example

GET request example process:

• Create a client session structure •
The client sends a GET request with header data (using default header data) • The server
responds with header data and body data • Print the server
response body data • GET request test
completes/failed

There are two ways to use the GET request example:

- Use the command web_get_test in MSH to execute the GET request sample program to obtain and print the default Confirm the file information downloaded from the URL, as shown in the LOG below:

```
msh />web_get_test
webclient GET request response data : RT-Thread is an
open source IoT operating system from China, which has strong scalability: from a tiny kernel running on a tiny
          core, for example ARM Cortex-M0, or Cortex-M3/4/7, to a rich feature system running on MIPS32, ARM
          Cortex-A8, ARM Cortex-A9 DualCore etc.


msh />
```

- Use the command web_get_test [URI] format command in MSH to execute the GET request sample program, where The URI is a user-defined address that supports GET requests.

2.2.2 POST Request Example

The example POST request process is as follows:

• Create a client session structure •

Concatenate the header data required for the POST

request • The client sends the concatenated header data and body

data • The server responds with the header data and body

data • Print the server response body data •

POST request test completes/failed

There are two ways to use the POST request example:

- Use the command web_post_test in MSH to execute the POST request sample program. You can obtain and print the response data (the default POST request address is similar to the echo address, which will return the uploaded data), as shown in the LOG display below:

```
msh />web_post_test
webclient POST request response data : RT-Thread is an
open source IoT operating system from China! msh />
```

- Use the command web_post_test [URI] format command in MSH to execute the POST request sample program, where The URI is a user-defined address that supports POST requests.

Chapter 3

How it works

The WebClient package is mainly used to implement the HTTP protocol on embedded devices. The main working principle of the package is It is implemented based on the HTTP protocol, as shown in the following figure:

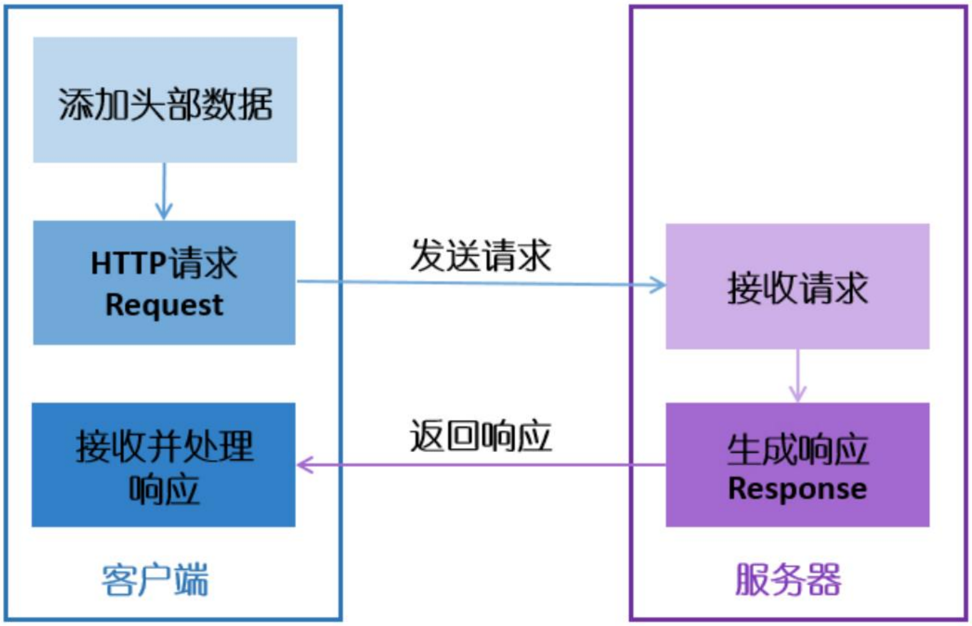


Figure **3.1:** *WebClient* How the software package works

The HTTP protocol defines how clients request data from servers and how servers transmit data to clients. The HTTP protocol uses a request/response model. The client sends a request message to the server, which includes the request method, URL, protocol version, request headers, and request data. The server responds with a status line containing the protocol version, success or error code, server information, response headers, and response data.

In the actual use of the HTTP protocol, the following process is generally followed:

1. Client connects to server

A TCP connection is usually established through a TCP three-way handshake, and the default HTTP port number is 80.

2. The client sends an HTTP request (GET/POST)

Through the TCP socket, the client sends a text request message to the Web server. A request message consists of four parts: request line, request header, blank line and request data.

3. The server accepts the request and returns an HTTP response

The server parses the request and locates the requested resource. The server writes the resource to the TCP socket, which the client reads. A response consists of a status line, a response header, a blank line, and the response data.

4. The client and server are disconnected

If the connection mode between the client and the server is normal mode, the server will actively close the TCP connection, and the client will passively close the connection and release the TCP connection. If the connection mode is keepalive mode, the connection will be maintained for a period of time, during which data can continue to be received.

5. The client parses the response data content

After the client obtains the data, it should first parse the response status code to determine whether the request is successful, then parse the response header line by line, obtain the response data information, and finally read the response data to complete the entire HTTP data sending and receiving process.

Chapter 4

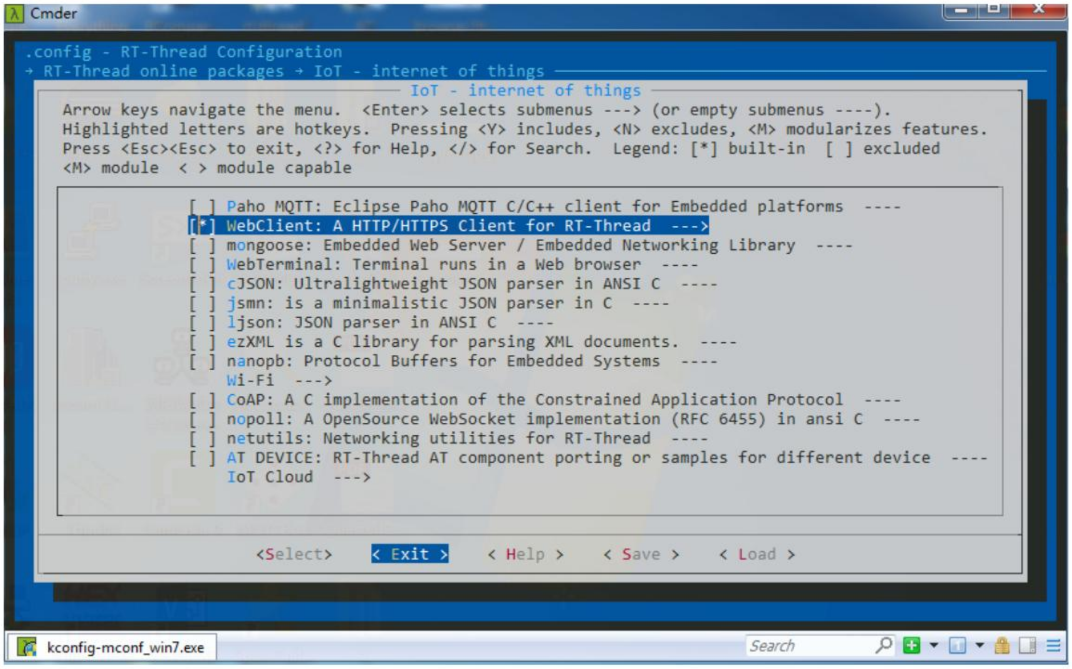
Usage Guidelines

This section mainly introduces the basic usage process of the WebClient software package, and focuses on the structures that are often involved in the use process.

A brief description of the body and important APIs.

4.1 Preparation

First, you need to download the WebClient package and add it to the project. In the BSP directory, use the menuconfig command to open the env configuration interface. Select the WebClient package in RT-Thread online packages ÿ IoT - internet of things . The operation interface is shown below:



```
.config - RT-Thread Configuration
→ RT-Thread online packages → IoT - internet of things
                          IoT - internet of things
  Arrow keys navigate the menu.  <Enter> selects submenus ---> (or empty submenus ----).
  Highlighted letters are hotkeys.  Pressing <Y> includes, <N> excludes, <M> modularizes features.
  Press <Esc><Esc> to exit, <?> for Help, </> for Search.  Legend: [*] built-in  [ ] excluded
  <M> module  < > module capable

              [ ] Paho MQTT: Eclipse Paho MQTT C/C++ client for Embedded platforms  ----
              [*] WebClient: A HTTP/HTTPS Client for RT-Thread  --->
              [ ] mongoose: Embedded Web Server / Embedded Networking Library  ----
              [ ] WebTerminal: Terminal runs in a Web browser  ----
              [ ] cJSON: Ultralightweight JSON parser in ANSI C  ----
              [ ] jsmn: is a minimalistic JSON parser in C  ----
              [ ] ljson: JSON parser in ANSI C  ----
              [ ] ezXML is a C library for parsing XML documents.  ----
              [ ] nanopb: Protocol Buffers for Embedded Systems  ----
                  Wi-Fi  --->
              [ ] CoAP: A C implementation of the Constrained Application Protocol  ----
              [ ] nopoll: A OpenSource WebSocket implementation (RFC 6455) in ansi C  ----
              [ ] netutils: Networking utilities for RT-Thread  ----
              [ ] AT DEVICE: RT-Thread AT component porting or samples for different device  ----
                  IoT Cloud  --->

              <Select>    < Exit >    < Help >    < Save >    < Load >
```

Figure 4.1: *WebClient* Package Configuration

The detailed configuration is as follows:

```
RT-Thread online packages
     IoT - internet of things --->
          [*] WebClient: A HTTP/HTTPS Client for RT-Thread
          [ ] Enable support tls protocol
          [ ] Enable webclient GET/POST samples
                 Version (latest) --->
```

Enable support tls protocol : Enable support for HTTPS;

Enable webclient GET/POST samples : Add sample code;

Version : Configure the software package version number.

After selecting the appropriate configuration item, use the pkgs --update command to download the software package and update the user configuration.

4.2 Usage Process

Using the WebClient package to send a GET/POST request generally requires the following basic process:

1. Create a client session structure

```
struct webclient_header
{
     char *buffer; size_t                          //Add or get header data
     length;                                       //Store the current header data length

     size_t size;                                  //Store the maximum supported header data length
};

struct webclient_session
{
     struct webclient_header *header; //Save header information structure
     int socket; int                               //Current connection socket
     resp_status;                                  //Response status code

     char *host; char                              //Connect to server address
     *req_url;                                     //Connection request address

     int chunk_size; int                           //chunk mode data size
     chunk_offset;                                 //chunk mode remaining data size

     int content_length; ÿÿ                        // Current received data length (non-chunk mode)
```

```
    size_t content_remainder;                    //The current remaining received data length

#ifdef WEBCLIENT_USING_TLS
    MbedTLSSession *tls_session;                 // HTTPS protocol related session structure
#endif
};
```

The webclient_session structure is used to store some information about the currently established HTTP connection and can be used to interact with HTTP data throughout the entire process. Before establishing an HTTP connection, this structure needs to be created and initialized. The creation method is as follows:

```
struct webclient_session *session = RT_NULL;

/* create webclient session and set header response size */ session = webclient_session_create(1024);
if (session == RT_NULL) {



    ret = -RT_ENOMEM; goto
    __exit;
}
```

2. Splicing head data

The WebClient package provides two ways to send request headers:

- Default header data

  If you want to use the default header information, you do not need to splice any header data and can directly call the GET command to send it. The default header data is generally only used for GET requests.

- Custom header data

Custom header data uses the webclient_header_fields_add function to add header information. The added header information is located in the client session structure and is sent when sending a GET/POST request.

Add the following sample code:

```
/* Splicing head information */
webclient_header_fields_add(session, "Content-Length: %d\r\n", strlen(
    post_data));

webclient_header_fields_add(session, "Content-Type: application/octet-
    stream\r\n");
```

3. Send **a GET/POST** request

After the header information is added, you can call the webclient_get function or the webclient_post function to send the GET/POST request command. The main operations in the function are as follows:

- Get information through the incoming URI and establish a TCP connection;
- Sending default or concatenated header information;
- Receive and parse the header information of the response data;
- Return an error or response status code.

The sample code for sending a GET request is as follows:

```
int resp_status = 0;

/* send GET request by default header */ if ((resp_status =
webclient_get(session, URI)) != 200) {

        LOG_E("webclient GET request failed, response(%d) error.",
                resp_status); ret =
        -RT_ERROR; goto
        __exit;
}
```

4. Receive response data

After sending a GET/POST request, you can use the webclient_read function to receive the actual response data. Because the actual response data may be long, we often need to loop to receive the response data until the data is received.

The following is a loop to receive and print the response data:

```
int content_pos = 0; /* Get the
length of the received response data*/
int content_length = webclient_content_length_get(session);

/* Loop to receive response data until all data is received*/
do
{
        bytes_read = webclient_read(session, buffer, 1024); if (bytes_read <= 0) {


                break;
        }

        /* Print response data */
        for (index = 0; index < bytes_read; index++) {

            rt_kprintf("%c", buffer[index]);
        }

        content_pos += bytes_read;
} while (content_pos < content_length);
```

5. Close and release the client session structure

After the request is sent and received, you need to use the webclient_close function to close and release the client session structure to complete the entire HTTP data interaction process.

Here’s how to use it:

```
if (session) {

        webclient_close(session);
}
```

4.3 Usage

The WenClient package provides several different ways to use GET/POST requests for different situations.

4.3.1 GET request method

- Send a GET request using default headers

```
struct webclient_session *session = NULL;

session = webclient_create(1024);

if(webclient_get(session, URI) != 200) {

        LOG_E("error!");
}
```

```
while(1) {

    webclient_read(session, buffer, bfsz);
    ...
}

webclient_close(session);
```

- Send GET request with custom headers

```
struct webclient_session *session = NULL;

session = webclient_create(1024);

webclient_header_fields_add(session, "User-Agent: RT-Thread HTTP Agent\r\
    n");

if(webclient_get(session, URI) != 200) {

    LOG_E("error!");
}

while(1) {

    webclient_read(session, buffer, bfsz);
    ...
}

webclient_close(session);
```

- Send a GET request to retrieve partial data (mostly used for resuming downloads)

```
struct webclient_session *session = NULL;

session = webclient_create(1024);

if(webclient_get_position(URI, 100) != 206) {

    LOG_E("error!");
}
```

```
while(1) {

    webclient_read(session, buffer, bfsz);
    ...
}

webclient_close(session)ÿ
```

- Using webclient_response to receive GET data is mostly used to receive

  GET requests with smaller data length.

```
struct webclient_session *session = NULL; char *result;

session = webclient_create(1024);

if(webclient_get(session, URI) != 200) {

    LOG_E("error!");
}

webclient_response(session, &result);

web_free(result);
webclient_close(session);
```

- Use the webclient_request function to send and receive GET requests

  It is mostly used to receive GET requests with small data length and concatenated header information.

```
char *result;

webclient_request(URI, header, NULL, &result);

web_free(result);
```

4.3.2 POST request method

- Multipart data POST request

  It is mostly used for POST requests that upload large amounts of data, such as uploading files to the server.

```
struct webclient_session *session = NULL;

session = webclient_create(1024);

/* Splice necessary header information */
webclient_header_fields_add(session, "Content-Length: %d\r\n",
        post_data_sz);
webclient_header_fields_add(session, "Content-Type: application/octet-
        stream\r\n");

/* Segmented data upload webclient_post The third transmission upload data is NULL, change to the following loop
        Transfer data*/
if( webclient_post(session, URI, NULL) != 200) {

        LOG_E("error!");
}

while(1) {

        webclient_write(session, post_data, 1024);
        ...
}

if( webclient_handle_response(session) != 200) {

        LOG_E("error!");
}

webclient_close(session);
```

- POST request for the entire data segment

It is mostly used for POST requests that upload small amounts of data.

```
char *post_data = "abcdefg";

session = webclient_create(1024);

/* Splice necessary header information */
webclient_header_fields_add(session, "Content-Length: %d\r\n", strlen(
        post_data));
webclient_header_fields_add(session, "Content-Type: application/octet-stream\r\n");
```

```
if(webclient_post(session, URI, post_data) != 200); {

        LOG_E("error!");

} webclient_close(session);
```

- Use the webclient_request function to send a POST request

  It is mostly used for uploading small files and POST requests where the header information has been concatenated.

```
char *post_data = "abcdefg";
char *header = "xxx";

webclient_request(URI, header, post_data, NULL);
```

4.4 Frequently Asked Questions

4.4.1 HTTPS address is not supported

```
[E/WEB]not support https connect, please enable webclient https configure
        '
```

- Cause: An HTTPS address is used but HTTPS support is not enabled.

- Solution: Enable the Enable support tls protocol option in the menuconfig configuration options of the WebClient package .

4.4.2 Header data length exceeds

```
[E/WEB]not enough header buffer size(xxx)!
```

- Cause: The length of the added header data exceeds the maximum supported header data length.

- Solution: When creating the client session structure, increase the maximum supported header data length passed in.

Chapter 5

API Description

5.1 Creating a Session

```
struct webclient_session *webclient_session_create(size_t header_sz);
```

Create a client session structure.

parameter	describe
header_sz	Maximum supported head length
return	describe
!= NULL	webclient session structure pointer
= NULL	Creation failed

5.2 Closing the Session Connection

```
int webclient_close(struct webclient_session *session);
```

Closes the incoming client session connection and frees memory.

parameter	describe
session	Pointer to the current connection session structure
return	describe
=0	success

5.3 Sending a GET Request

```
int webclient_get(struct webclient_session session, const char URI);
```

Send an HTTP GET request command.

parameter	describe
session	Pointer to the current connection session structure
TYPE	HTTP server address to connect to
return	describe
>0	HTTP response status codes
<0	Failed to send request

5.4 Send a GET request to obtain partial data

```
int webclient_get_position(struct webclient_session session, const char URI, int
position);
```

Send an HTTP GET request command with Range header information, which is mostly used to complete the breakpoint resume function.

parameter	describe
session	Pointer to the current connection session structure
TYPE	HTTP server address to connect to
position	Data offset
return	describe
>0	HTTP response status codes
<0	Failed to send request

5.5 Sending a POST Request

```
int webclient_post(struct webclient_session session, const char URI, const char
*post_data);
```

Send HTTP POST request command to upload data to the HTTP server.

parameter	describe
session	Pointer to the current connection session structure
TYPE	HTTP server address to connect to
post_data	The address of the data to be uploaded
return	describe
>0	HTTP response status codes
<0	Failed to send request

5.6 Sending Data

```
int webclient_write(struct webclient_session session, const unsigned char buffer,
size_t size);
```

Sends data to the connected server.

parameter	describe
session	Pointer to the current connection session structure
buffer	Address to send data to
size	The length of the sent data
return	describe
>0	The length of the successfully sent data
=0	Connection closed
<0	Failed to send data

5.7 Receiving Data

```
int webclient_read(struct webclient_session session, unsigned char buffer, size_t
size);
```

Receives data from a connected server.

parameter	describe
session	Pointer to the current connection session structure
buffer	Storage address of received data

parameter	describe
size	Maximum length of received data
return	describe
>0	The length of the successfully received data
=0	Connection closed
<0	Failed to receive data

5.8 Set the timeout for receiving and sending data

```
int webclient_set_timeout(struct webclient_session *session, int millisecond);
```

Set the timeout for receiving and sending data on the connection.

parameter	describe
session	Pointer to the current connection session structure
millisecond	The timeout period set in milliseconds
return	describe
=0	Set timeout successfully

5.9 Adding field data to the request header

```
int webclient_header_fields_add(struct webclient_session session, const char

fmt, …);
```

This function is used to add request header field data after creating a session and before sending a GET or POST request.

parameter	describe
session	Pointer to the current connection session structure
fmt	Add an expression to field data
…	The added field data is a variable parameter
return	describe
>0	The length of the field data successfully added
<=0	Add failed or header data length exceeded

5.10 Get field value data by field name

const char *webclient_header_fields_get(struct webclient_session* session, const

char *fields);

This function is used to get the corresponding field number by passing in the field name after sending a GET or POST request.

according to.

parameter	describe
session	Pointer to the current connection session structure
fields	HTTP field names
return	describe
= NULL	Failed to obtain data
!= NULL	Field data successfully obtained

5.11 Receive response data to the specified address

int webclient_response(struct webclient_session *session, unsigned char **re-sponse);

This function is used to send a GET or POST request and receive the response data to the specified address.

parameter	describe
session	Pointer to the current connection session structure
response	The string address where the received data is stored
return	describe
>0	The length of the successfully received data
<=0	Failed to receive data

5.12 Send **GET/POST** request and receive response data

int webclient_request(const char *URI, const char* header, const char *post_data,

unsigned char **response);

parameter	describe
TYPE	HTTP server address to connect to
header	Header data to be sent
	= NULL, send default header data information, only used to send GET request
	!= NULL, send the specified header data information, which can be used to send GET/ POST request
post_data	Data sent to the server
	= NULL, the request is a GET request
	!= NULL, the request is a POST request
response	The string address where the received data is stored
return	describe
>0	The length of the successfully received data
<=0	Failed to receive data

5.13 Get HTTP response status code

```
int webclient_resp_status_get(struct webclient_session *session);
```

This function is used to get the returned response status code after sending a GET or POST request.

parameter	describe
session	Pointer to the current connection session structure
return	describe
>0	HTTP response status codes

5.14 Get Content-Length field data

```
int webclient_content_length_get(struct webclient_session *session);
```

This function is used to obtain the returned Content-Length field data after sending a GET or POST request.

parameter	describe
session	Pointer to the current connection session structure

parameter	describe
return	describe
>0	Content-Length field data
<0	Failed to obtain

5.15 Download the file to your local computer

```
int webclient_get_file(const char URI, const char filename);
```

Download files from the HTTP server and store them locally.

parameter	describe
TYPE	HTTP server address to connect to
filename	Storage file location and name
return	describe
=0	Download file successfully
<0	Failed to download the file

5.16 Upload files to the server

```
int webclient_post_file(const char URI, const char filename, const char
*form_data);
```

Download files from the HTTP server and store them locally.

parameter	describe
TYPE	HTTP server address to connect to
filename	The location and name of the file to be uploaded
form_data	Additional Options
return	describe
=0	Upload file successfully
<0	File upload failed