

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <string.h>
4 #include <unistd.h>
5 #include <arpa/inet.h>
6 #define PORT 8080
7 #define BUFFER_SIZE 1024
8 int main() {
9     int server_fd, new_socket;
10    struct sockaddr_in address;
11    char buffer[BUFFER_SIZE];
12    server_fd = socket(AF_INET, SOCK_STREAM, 0);
13    address.sin_family = AF_INET;
14    address.sin_addr.s_addr = INADDR_ANY;
15    address.sin_port = htons(PORT);
16    bind(server_fd, (struct sockaddr *)&address, sizeof(address));
17    listen(server_fd, 1);
18    new_socket = accept(server_fd, NULL, NULL);
19
20    while (1) {
21        memset(buffer, 0, BUFFER_SIZE);
22        int bytes_read = read(new_socket, buffer, BUFFER_SIZE);
23        if (bytes_read <= 0) break;
24        send(new_socket, buffer, bytes_read, 0); // Echo back
25    }
26
27    close(new_socket);
28    close(server_fd);
29    return 0;
30 }
31
```

```
/tmp/bG16GChPQh.o
gcc echo_server.c -o echo_server
gcc echo_client.c -o echo_client
```



```
1  #include <stdio.h>
2  #include <stdlib.h>
3  #include <string.h>
4  #include <unistd.h>
5  #include <arpa/inet.h>
6
7  #define PORT 8080
8  #define BUFFER_SIZE 1024
9  int main() {
10     int server_fd, new_socket;
11     struct sockaddr_in address;
12     char buffer[BUFFER_SIZE];
13     server_fd = socket(AF_INET, SOCK_STREAM, 0);
14     address.sin_family = AF_INET;
15     address.sin_addr.s_addr = INADDR_ANY;
16     address.sin_port = htons(PORT);
17     bind(server_fd, (struct sockaddr *)&address, sizeof(address));
18     listen(server_fd, 1);
19     new_socket = accept(server_fd, NULL, NULL);
20     while (1) {
21         read(new_socket, buffer, BUFFER_SIZE);
22         printf("Client: %s\n", buffer);
23         printf("You: ");
24         fgets(buffer, BUFFER_SIZE, stdin);
25         send(new_socket, buffer, strlen(buffer), 0);
26     }
27     close(new_socket);
28     close(server_fd);
29     return 0;
30 }
31
```

```
/tmp/kTAWY9yM4u.o
gcc server.c -o server
gcc client.c -o client
```

main.c



Share

Run

Output

Clear

/tmp/aQpn0oN9E0.o

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <string.h>
4 #include <arpa/inet.h>
5 #include <unistd.h>
6 #define PORT 8080
7 #define BUFFER_SIZE 1024
8 void sendFile(int socket, const char *filename) {
9     FILE *file = fopen(filename, "rb");
10    char buffer[BUFFER_SIZE];
11    size_t bytesRead;
12    while ((bytesRead = fread(buffer, 1, BUFFER_SIZE, file)) >
13           0) {
14        send(socket, buffer, bytesRead, 0);
15        fclose(file);
16    }
17 }
18 int main() {
19     int server_fd, new_socket;
20     struct sockaddr_in address;
21     int opt = 1, addrlen = sizeof(address);
22     server_fd = socket(AF_INET, SOCK_STREAM, 0);
23     setsockopt(server_fd, SOL_SOCKET, SO_REUSEADDR, &opt, (opt));
24     address.sin_family = AF_INET;
25     address.sin_addr.s_addr = INADDR_ANY;
26     address.sin_port = htons(PORT);
27     bind(server_fd, (struct sockaddr *)&address, sizeof(address));
28     listen(server_fd, 3);
29     new_socket = accept(server_fd, (struct sockaddr *)&address,
30                        (socklen_t *)&addrlen);
31     sendFile(new_socket, "file_to_send.txt"); // Replace with your
32                                             filename
33     close(new_socket);
34     close(server_fd);
35     return 0;
36 }
```

```
1 #include <stdio.h>
2 #include <string.h>
3 #define POLYNOMIAL 0xA001
4 unsigned short crc16(const unsigned char *data, size_t length) {
5     unsigned short crc = 0xFFFF; // Initial CRC value
6     for (size_t i = 0; i < length; i++) {
7         crc ^= data[i];
8         for (size_t j = 0; j < 8; j++) {
9             if (crc & 0x0001) {
10                 crc >>= 1;
11                 crc ^= POLYNOMIAL;
12             } else {
13                 crc >>= 1;
14             }
15         }
16     }
17     return crc;}
18 void simulateError(unsigned char *data) {
19     data[0] ^= 0x01; // Flip the first bit to simulate an error
20 int main() {
21     unsigned char data[] = "Hello, CRC!";
22     unsigned short originalCrc = crc16(data, length);
23     printf("Original CRC: 0x%04X\n", originalCrc);
24     simulateError(data);
25     unsigned short receivedCrc = crc16(data, length);
26     printf("Received CRC: 0x%04X\n", receivedCrc);
27     if (receivedCrc == originalCrc) {
28         printf("No error detected.\n");
29     } else {
30         return 0;
31     }
```

```
/tmp/uYnnCN0xtg.o
Original CRC: 0x84CD
Received CRC: 0x78C9
Error detected!
```

```
=== Code Execution Successful ===
```



main.c



Share

Run

Output

Clear

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <string.h>
4 #define DNS_SERVER "8.8.8.8" // Google DNS
5 #define DNS_PORT 53
6 #define BUFFER_SIZE 512
7- void create_query(char *buf, const char *host) {
8     unsigned short *id = (unsigned short *)buf;
9     *id = htons(getpid());
10    buf[2] = 0x01; // recursion desired
11    buf[5] = 0x01; // one question
12    char *q = buf + 12; // skip header
13-    for (char *token = strtok((char *)host, "."); token; token =
14        strtok(NULL, ".")) {
15        *q++ = strlen(token);
16        strcpy(q, token);
17-    if (argc != 2) {
18        fprintf(stderr, "Usage: %s <hostname>\n", argv[0]);
19        return 1;    }    int sock = socket(AF_INET, SOCK_DGRAM, 0
20        );    struct sockaddr_in servaddr = {0};
21    servaddr.sin_family = AF_INET;
22    servaddr.sin_port = htons(DNS_PORT);
23-    sendto(sock, buf, sizeof(buf), 0, (struct sockaddr *)
24    struct in_addr addr;
25    memcpy(&addr, buf + sizeof(buf) + strlen(argv[1]) + 2 + 4,
26        sizeof(addr));
27    printf("IP Address: %s\n", inet_ntoa(addr));
28    close(sock);
29    return 0;
30 }
```

/tmp/HChhamHQxH.o

Usage: /tmp/HChhamHQxH.o <hostname>

=== Code Exited With Errors ===



```
1 #include <stdio.h>
2 #include <stdlib.h>
3 #include <string.h>
4 #include <unistd.h>
5 #include <time.h>
6 #define MAX_RETRIES 5
7 #define TIMEOUT 2 // seconds
8 #define MESSAGE "Hello, Receiver!"
9 void send_message(const char *message) {
10     printf("Sender: Sending message: %s\n", message);}
11 int receive_acknowledgment() {
12     return rand() % 2; // Randomly return 0 (no ack) or 1 (ack)
13 }
14 int main() {
15     srand(time(NULL)); // Seed for random number generation
16     int retries = 0;
17     int ack_received = 0;
18     while (retries < MAX_RETRIES && !ack_received) {
19         send_message(MESSAGE);
20         sleep(TIMEOUT); // Simulate waiting for an ACK
21         ack_received = receive_acknowledgment();
22         if (ack_received) {
23             printf("Sender: Acknowledgment received.\n");
24         } else {
25             printf("Sender: No acknowledgment. Retrying... (%d)\n",
26                 ++retries);
27         }
28     }
29     if (retries == MAX_RETRIES) {
30         printf("Sender: Max retries reached. Message sending failed.\n");
31     }
32     return 0;
}
```

/tmp/BNie9kqr4X.o

Sender: Sending message: Hello, Receiver!

Sender: Acknowledgment received.

=== Code Execution Successful ===

Wi-Fi

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tcp

No.	Time	Source	Destination	Protocol	Length	Info
46	13.429070	2409:40f4:3f:615a:1...	2404:6800:4007:826:...	TCP	75	61404 → 443 [ACK] Seq=1 Ack=1 Win=256 Len=1
49	13.467240	2404:6800:4007:826:...	2409:40f4:3f:615a:1...	TCP	86	443 → 61404 [ACK] Seq=1 Ack=2 Win=278 Len=0 SLE=1 SRE=2
56	14.563612	157.240.192.55	192.168.133.237	TCP	443	80 → 51029 [PSH, ACK] Seq=2120 Ack=277 Win=277 Len=389
57	14.579178	192.168.133.237	157.240.192.55	TCP	123	51029 → 80 [PSH, ACK] Seq=277 Ack=2509 Win=258 Len=69
58	14.615349	157.240.192.55	192.168.133.237	TCP	54	80 → 51029 [ACK] Seq=2509 Ack=346 Win=277 Len=0
79	15.707500	157.240.192.55	192.168.133.237	TCP	459	80 → 51029 [PSH, ACK] Seq=2509 Ack=346 Win=277 Len=405
80	15.716634	192.168.133.237	157.240.192.55	TCP	123	51029 → 80 [PSH, ACK] Seq=346 Ack=2914 Win=257 Len=69
81	15.758518	157.240.192.55	192.168.133.237	TCP	54	80 → 51029 [ACK] Seq=2914 Ack=415 Win=277 Len=0
84	16.920164	157.240.192.55	192.168.133.237	TCP	459	80 → 51029 [PSH, ACK] Seq=2914 Ack=415 Win=277 Len=405
85	16.975029	192.168.133.237	157.240.192.55	TCP	54	51029 → 80 [ACK] Seq=415 Ack=3319 Win=255 Len=0
86	17.069677	192.168.133.237	157.240.192.55	TCP	123	51029 → 80 [PSH, ACK] Seq=415 Ack=3319 Win=255 Len=69
87	17.091399	157.240.192.55	192.168.133.237	TCP	54	80 → 51029 [ACK] Seq=3319 Ack=484 Win=277 Len=0
90	18.739479	157.240.192.55	192.168.133.237	TCP	974	80 → 51029 [PSH, ACK] Seq=3319 Ack=484 Win=277 Len=920
91	18.784072	192.168.133.237	157.240.192.55	TCP	54	51029 → 80 [ACK] Seq=484 Ack=4239 Win=258 Len=0
92	18.849470	192.168.133.237	157.240.192.55	TCP	123	51029 → 80 [PSH, ACK] Seq=484 Ack=4239 Win=258 Len=69
93	18.927143	157.240.192.55	192.168.133.237	TCP	54	80 → 51029 [ACK] Seq=4239 Ack=553 Win=277 Len=0
94	19.691878	157.240.192.55	192.168.133.237	TCP	445	80 → 51029 [PSH, ACK] Seq=4239 Ack=553 Win=277 Len=391
95	19.702775	192.168.133.237	157.240.192.55	TCP	123	51029 → 80 [PSH, ACK] Seq=553 Ack=4630 Win=257 Len=69
96	19.753031	157.240.192.55	192.168.133.237	TCP	54	80 → 51029 [ACK] Seq=4630 Ack=622 Win=277 Len=0
97	19.918886	2409:40f4:3f:615a:1...	2405:200:1630:c8e:1...	TCP	75	51105 → 443 [ACK] Seq=1 Ack=1 Win=254 Len=1
98	19.962762	2405:200:1630:c8e:1...	2409:40f4:3f:615a:1...	TCP	86	443 → 51105 [ACK] Seq=1 Ack=2 Win=501 Len=0 SLE=1 SRE=2
100	20.447016	2409:40f4:3f:615a:1...	2405:200:1630:181:1...	TCP	74	61392 → 80 [FIN, ACK] Seq=1 Ack=1 Win=257 Len=0
101	20.447235	2409:40f4:3f:615a:1...	2404:6800:4007:81f:...	TCP	74	61393 → 80 [FIN, ACK] Seq=1 Ack=1 Win=257 Len=0

Frame 57: 123 bytes on wire (984 bits), 123 bytes captured (984 bits) on Interface \Device\NPF...

Ethernet II, Src: Intel_de:c3:e9 (f4:06:69:de:c3:e9), Dst: 2a:99:57:fb:7f:2a (2a:99:57:fb:7f:2a)

Internet Protocol Version 4, Src: 192.168.133.237, Dst: 157.240.192.55

Transmission Control Protocol, Src Port: 51029, Dst Port: 80, Seq: 277, Ack: 2509, Len: 69

Source Port: 51029

Destination Port: 80

[Stream index: 3]

[Stream Packet Number: 20]

[Conversation completeness: Incomplete (12)]

[TCP Segment Len: 69]

Sequence Number: 277 (relative sequence number)

Sequence Number (raw): 2860272032

[Next Sequence Number: 346 (relative sequence number)]

Acknowledgment Number: 2509 (relative ack number)

Acknowledgment number (raw): 3448976110

0000 2a 99 57 fb 7f 2a f4 06 69 de c3 e9 00 00 45 00 *W...I...E...
 0010 00 6d d3 63 40 00 00 06 82 69 c0 a8 85 ed 9d f0 m c...i...
 0020 c0 37 c7 55 00 50 aa 7c 4c c0 fd 93 33 ee 50 18 7.U.P. | L...z.p...
 0030 01 02 61 03 00 00 33 46 0d 0a 00 00 3c 0d 09 c3 ...a...3F...<...
 0040 df c2 99 8b 6e d0 9a 69 ea f1 8b 57 a7 5f bc fc ...n...i...W...
 0050 5f 01 df f4 4c 66 66 83 57 4b c3 83 21 a4 66 b6 ...Lff...WK...l.f...
 0060 b6 e6 1d 09 9b 70 49 93 60 b2 d8 4c ae 98 10 5c ...p...I...L...
 0070 71 fa 10 42 5b 4f 07 86 d1 0d 0a q...B[0...<...<...

Acknowledgment Number (tcp.ack), 4 bytes

Packets: 215 · Displayed: 113 (52.6%) · Dropped: 0 (0.0%) Profile: Default

36°C Partly sunny

ENG 2:11 PM

Wi-Fi
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arp

No.	Time	Source	Destination	Protocol	Length	Info
33	9.093294	2a:99:57:fb:7f:2a	Intel_de:c3:e9	ARP	42	Who has 192.168.133.237? Tell 192.168.133.88
34	9.093316	Intel_de:c3:e9	2a:99:57:fb:7f:2a	ARP	42	192.168.133.237 is at f4:06:69:de:c3:e9
90	36.036446	2a:99:57:fb:7f:2a	Intel_de:c3:e9	ARP	42	Who has 192.168.133.237? Tell 192.168.133.88
91	36.036491	Intel_de:c3:e9	2a:99:57:fb:7f:2a	ARP	42	192.168.133.237 is at f4:06:69:de:c3:e9
154	66.200420	2a:99:57:fb:7f:2a	Intel_de:c3:e9	ARP	42	Who has 192.168.133.237? Tell 192.168.133.88
155	66.200439	Intel_de:c3:e9	2a:99:57:fb:7f:2a	ARP	42	192.168.133.237 is at f4:06:69:de:c3:e9
172	81.816264	2a:99:57:fb:7f:2a	Intel_de:c3:e9	ARP	42	Who has 192.168.133.237? Tell 192.168.133.88
173	81.816302	Intel_de:c3:e9	2a:99:57:fb:7f:2a	ARP	42	192.168.133.237 is at f4:06:69:de:c3:e9
267	98.456565	2a:99:57:fb:7f:2a	Intel_de:c3:e9	ARP	42	Who has 192.168.133.237? Tell 192.168.133.88
268	98.456592	Intel_de:c3:e9	2a:99:57:fb:7f:2a	ARP	42	192.168.133.237 is at f4:06:69:de:c3:e9
269	98.932045	Intel_de:c3:e9	2a:99:57:fb:7f:2a	ARP	42	Who has 192.168.133.88? Tell 192.168.133.237
270	98.957925	2a:99:57:fb:7f:2a	Intel_de:c3:e9	ARP	42	192.168.133.88 is at 2a:99:57:fb:7f:2a
286	123.672507	Intel_de:c3:e9	Broadcast	ARP	42	Who has 192.168.133.88? Tell 192.168.133.237
289	123.735273	2a:99:57:fb:7f:2a	Intel_de:c3:e9	ARP	42	192.168.133.88 is at 2a:99:57:fb:7f:2a
291	123.743520	Intel_de:c3:e9	Broadcast	ARP	42	Who has 192.168.133.88? Tell 192.168.133.237
292	123.747919	2a:99:57:fb:7f:2a	Intel_de:c3:e9	ARP	42	192.168.133.88 is at 2a:99:57:fb:7f:2a
328	123.939106	Intel_de:c3:e9	Broadcast	ARP	42	Who has 192.168.133.237? (ARP Probe)
348	123.982209	Intel_de:c3:e9	Broadcast	ARP	42	Who has 192.168.133.88? Tell 192.168.133.237
350	123.984503	2a:99:57:fb:7f:2a	Intel_de:c3:e9	ARP	42	192.168.133.88 is at 2a:99:57:fb:7f:2a
369	124.085234	AzureWaveTec_8e:01:1a	Broadcast	ARP	42	ARP Announcement for 192.168.133.219
468	124.939905	Intel_de:c3:e9	Broadcast	ARP	42	Who has 192.168.133.237? (ARP Probe)
538	125.931332	Intel_de:c3:e9	Broadcast	ARP	42	Who has 192.168.133.237? (ARP Probe)
734	126.034671	Intel_de:c3:e9	Broadcast	ARP	42	ARP Announcement for 192.168.133.237

Frame 90: 42 bytes on wire (336 bits), 42 bytes captured (336 bits) on interface \Device\NPF{...}

Ethernet II, Src: 2a:99:57:fb:7f:2a (2a:99:57:fb:7f:2a), Dst: Intel_de:c3:e9 (f4:06:69:de:c3:e9)

Address Resolution Protocol (request)

Hardware type: Ethernet (1)

Protocol type: IPv4 (0x0800)

Hardware size: 6

Protocol size: 4

Opcode: request (1)

Sender MAC address: 2a:99:57:fb:7f:2a (2a:99:57:fb:7f:2a)

Sender IP address: 192.168.133.88

Target MAC address: 00:00:00:00:00:00 (00:00:00:00:00:00)

Target IP address: 192.168.133.237

0000 f4 06 69 de c3 e9 2a 99 57 fb 7f 2a 00 00 00 01 ...i... W...
0010 00 00 06 04 00 01 2a 99 57 fb 7f 2a c0 a8 85 58 W...X
0020 00 00 00 00 00 00 c0 a8 85 ed

Address Resolution Protocol: Protocol

Packets: 2076 · Displayed: 34 (1.6%) · Dropped: 0 (0.0%) Profile: Default

36°C Partly sunny 2:29 PM


```

Frame 23017: 131 bytes on wire (1048 bits), 131 bytes captured (1048 bits) on interface \Device\NPF...
Ethernet II, Src: 6XIndia.77:1c:30 (20:0c:06:77:1c:30), Dst: CloudNetwork.bd.64:d9 (cc:5e:f0:bd:64:d9)
Internet Protocol Version 4, Src: 74.125.24.109, Dst: 192.168.1.8
Transmission Control Protocol, Src Port: 25, Dst Port: 65143, Seq: 1, Ack: 1, Len: 77
Simple Mail Transfer Protocol

```

