Vendor of the products: Tenda

Affected products: Tenda TX3 V16.03.13.11_multi

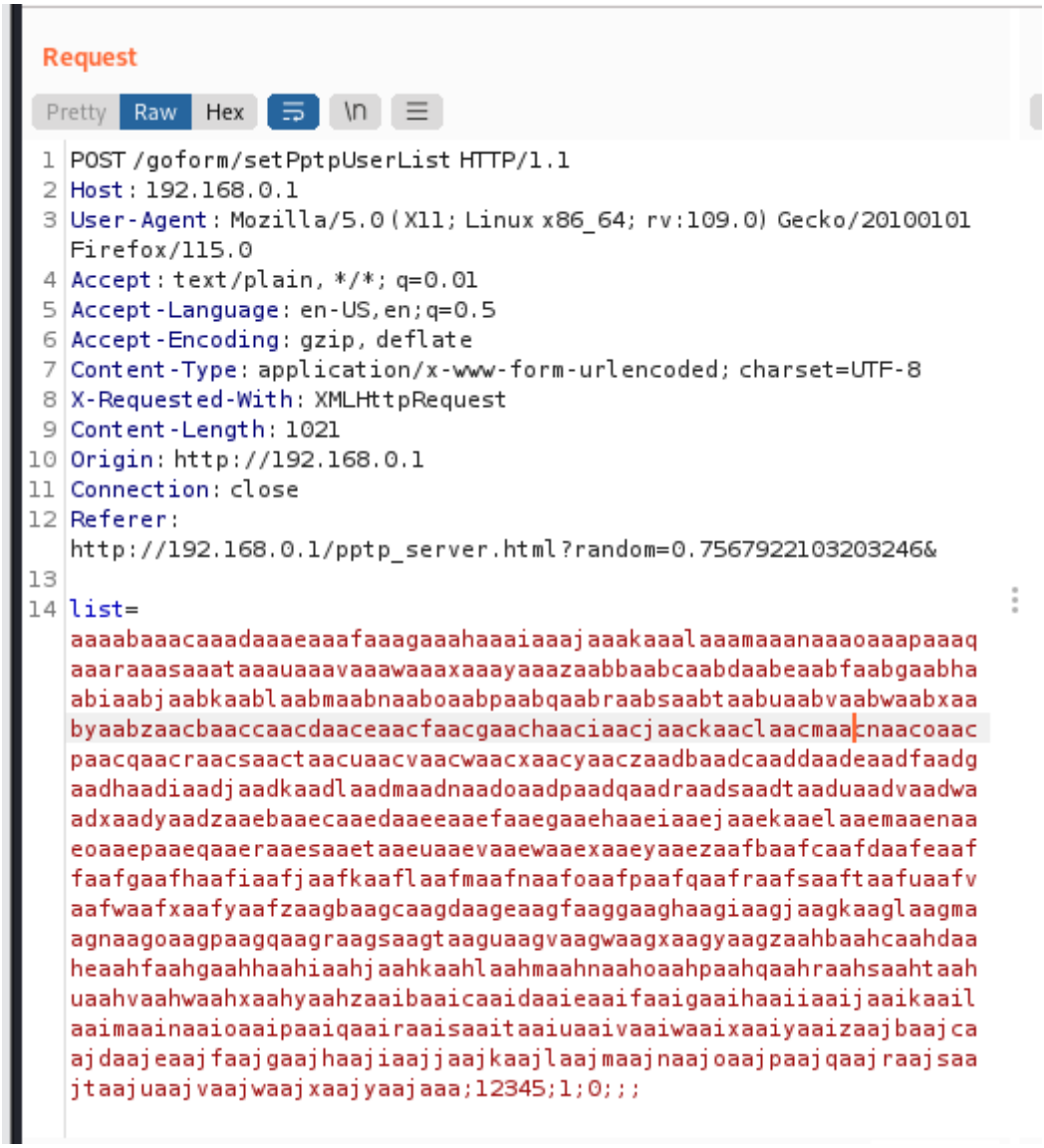
Hardware Link: https://www.tendacn.com/tw/download/detail-4015.html

Vulnerability Description

A buffer overflow vulnerability was discovered in Tenda TX3 V16.03.13.11_multi, triggered by the list parameter at /goform/setPptpUserList. This vulnerability allows attackers to cause a Denial of Service (DoS) via a crafted packet.

POC

send



You can see that the router has crashed.

```
func:cfms_mib_proc_handle, line:203 connect cfmd is error.
sscanf usr list from web err!
connect: No such file or directory
func:cfms_mib_proc_handle, line:203 connect cfmd is error.
connect: No such file or directory
func:cfms_mib_proc_handle, line:203 connect cfmd is error.
zsh: segmentation fault  sudo chroot ./ ./qemu-arm-static ./bin/httpd
```

Code in httpd

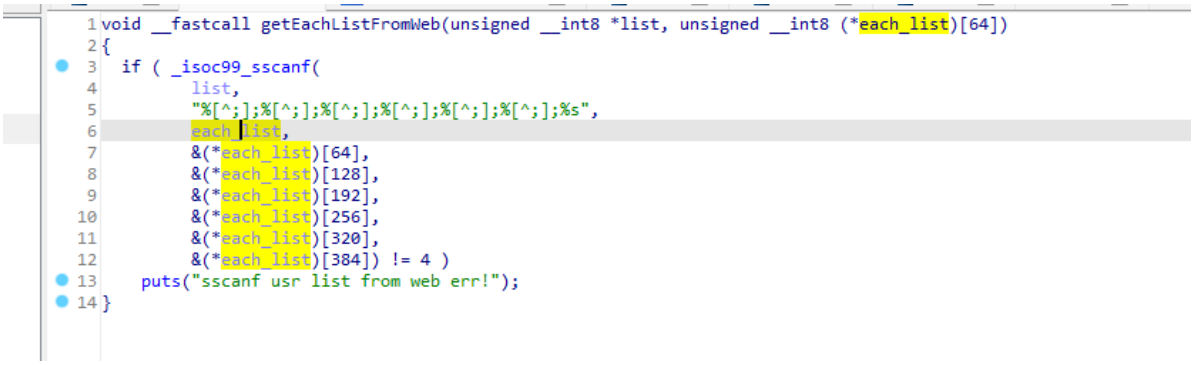
The `formSetPPTPUserList` function calls the `set_pptpuser_list` function.

```
1  void __fastcall formSetPPTPUserList(webs_t wp, char_t *path, char_t *query)
2  {
3    int v4; // r0
4    cgi_msg v5; // r0
5    int v6; // r7
6    int v7; // r0
7    int all_users_same[16]; // [sp+8h] [bp-2760h] BYREF
8    unsigned __int8 param_str[256]; // [sp+48h] [bp-2720h] BYREF
9    unsigned __int8 pptp_users[512]; // [sp+148h] [bp-2620h] BYREF
10   unsigned __int8 all_pptp_username[16][64]; // [sp+348h] [bp-2420h] BYREF
11   unsigned __int8 before_pptp_users_value[8][512]; // [sp+748h] [bp-2020h] BYREF
12   unsigned __int8 new_pptp_users_value[8][512]; // [sp+1748h] [bp-1020h] BYREF
13
14   memset(all_pptp_username, 0, sizeof(all_pptp_username));
15   memset(before_pptp_users_value, 0, sizeof(before_pptp_users_value));
16   memset(new_pptp_users_value, 0, sizeof(new_pptp_users_value));
17   v4 = init_setpptpuser(before_pptp_users_value, all_pptp_username, pptp_users, 512);
18   v5 = set_pptpuser_list(wp, new_pptp_users_value, all_pptp_username, v4, pptp_users);
19   if ( v5 == CGI_ERROR
20     || (v6 = v5,
21         get_same_pptpuser(all_users_same, before_pptp_users_value, new_pptp_users_value, all_pptp_username),
22         change_pptpuser_name(all_users_same, all_pptp_username),
23         !CommitCfm(v7)) )
24   {
25     v6 = 1;
26   }
27   else
28   {
29     memset(param_str, 0, sizeof(param_str));
30     sprintf((char *)param_str, "op=%d", 3);
31     send_msg_to_netctrl(20, (int)param_str);
32     sprintf((char *)param_str, "advance_type=%d", 1);
33     send_msg_to_netctrl(5, (int)param_str);
34   }
35   websWrite(
36     wp,
37     (char_t *)"HTTP/1.1 200 OK\nContent-type: text/plain; charset=utf-8\nPragma: no-cache\nCache-Control: no-cache\n\n");
38   websWrite(wp, (char_t *)"{\"errCode\":%d}", v6);
39   websDone(wp, 200);
40 }
```

In the `set_pptpuser_list` function, the `list` parameter is first retrieved and stored in `v7`. After parsing `v7`, the `getEachListFromWeb` function is called.

```
10   unsigned __int8 *v15; // r0
11   const char *v16; // r5
12   unsigned __int8 pptp_users_each[7][64]; // [sp+38h] [bp-3E8h] BYREF
13   unsigned __int8 value[512]; // [sp+1F8h] [bp-228h] BYREF
14
15   memset(value, 0, sizeof(value));
16   memset(pptp_users_each, 0, sizeof(pptp_users_each));
17   v7 = websGetVar(wp, (char_t *)"list", (char_t *)&byte_7A45B);
18   if ( !pptp_users )
19     return 1;
20   if ( *v7 )
21   {
22     v9 = (const char *)&v7[strspn((const char *)v7, "~")];
23     strncpy((char *)value, v9, 0x200u);
24     v10 = 0;
25     value[strcspn((const char *)value, "~")] = 0;
26     value[511] = 0;
27     v11 = strchr(v9, 126);
28     while ( value[0] )
29     {
30       memset(pptp_users_each, 0, sizeof(pptp_users_each));
31       getEachListFromWeb(value, pptp_users_each);
32       if ( (unsigned int)atoi((const char *)pptp_users_each[3]) > 1 )
33         return 1;
34       v12 = atoi((const char *)pptp_users_each[2]);
35       sprintf(
36         (char *)pptp_users,
37         "%d;%d;%s;%s;%s;%s;%s;%s",
38         v12,
39         v10,
40         pptp_users_each,
41         pptp_users_each[3],
42         pptp_users_each[1],
```

In the `getEachListFromWeb` function, the `_isoc99_sscanf` function is called to copy the parsed data into `each_list` without any length restriction, leading to a buffer overflow.



```
void __fastcall getEachListFromWeb(unsigned __int8 *list, unsigned __int8 (*each_list)[64])
{
  if ( _isoc99_sscanf(
         list,
         "%[^;];%[^;];%[^;];%[^;];%[^;];%[^;];%s",
         each_list,
         &(*each_list)[64],
         &(*each_list)[128],
         &(*each_list)[192],
         &(*each_list)[256],
         &(*each_list)[320],
         &(*each_list)[384]) != 4 )
    puts("sscanf usr list from web err!");
}
```