BYPASSING SECURITY RESTRICTIONS

THE CASE OF CVE-2018-5955

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Whoami

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- **Adam Nurudini**

  CEH, ITIL V3, CCNA, CCNP, CASP, PCI-DSS, BSC-IT

  Lead Security Researcher @ Netwatch Technologies
  Project Consultant, Information Security Architects Ltd
  Member, Cybersecurity Resilience Service Team
  Web Application Penetration Tester

NETWATCH
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CSRT Cybersecurity Resilience Services Team
MEMBER | www.csrt.org.gh

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INTRODUCTION

The following presentation describes an unauthenticated action in GitStack that allows a remote attacker to add new users and then trigger remote code execution.

CVE-ID
CVE-2018-5955

Description
An issue was discovered in GitStack through 2.3.10. User controlled input is not sufficiently filtered, allowing an unauthenticated attacker to add a user to the server via the username and password fields to the rest/user/ URI.

Source: https://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2018-5955

Vulnerability Disclosed by:
An independent security researcher, Kacper Szurek, reported the vulnerability to Beyond Security's SSD

Vendor response
“Since October 17, 2017, we have tried to contact GitStack many times and have received a response, but have not provided details about the solution or workaround.”

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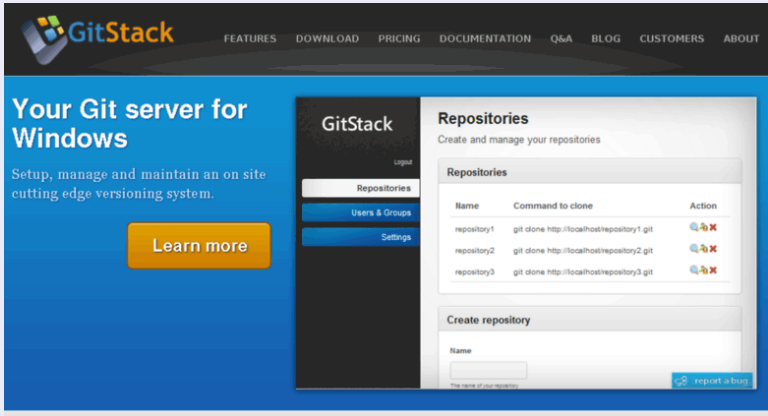
- GitStack is a web application that allows users to set up your own private Git server.
- This means you can create a version control system with no content.
- GitStack makes it easy to keep your server up to date. It is really Git for Windows and is compatible with any other Git client. GitStack is completely free for small teams.



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Impact

CVSS v3.0 Severity and Metrics:

Base Score: 9.8 CRITICAL
Vector: AV:N/AC:L/PR:N/UI:N/S:U/C:H/I:H/A:H (V3 legend)
Impact Score: 5.9
Exploitability Score: 3.9

Attack Vector (AV): Network
Attack Complexity (AC): Low
Privileges Required (PR): None
User Interaction (UI): None
Scope (S): Unchanged
Confidentiality (C): High
Integrity (I): High
Availability (A): High

CVSS v2.0 Severity and Metrics:

Base Score: 7.5 HIGH
Vector: (AV:N/AC:L/Au:N/C:P/I:P/A:P) (V2 legend)
Impact Subscore: 6.4
Exploitability Subscore: 10.0

Access Vector (AV): Network
Access Complexity (AC): Low
Authentication (AU): None
Confidentiality (C): Partial
Integrity (I): Partial
Availability (A): Partial
Additional Information:
Allows unauthorized disclosure of information
Allows unauthorized modification
Allows disruption of service

EXPLOIT AVAILABILITY
https://www.exploit-db.com/exploits/43777/
https://www.rapid7.com/db/modules/exploit/windows/http/gitstack_rce

Source: https://nvd.nist.gov/vuln/detail/CVE-2018-5955

UPCLOSE WITH CVE-2018-5955

In vulnerable versions of GitStack, a flaw in Authentication.class.php allows unauthenticated remote code execution since $_SERVER['PHP_AUTH_PW'] is passed directly to an exec function.

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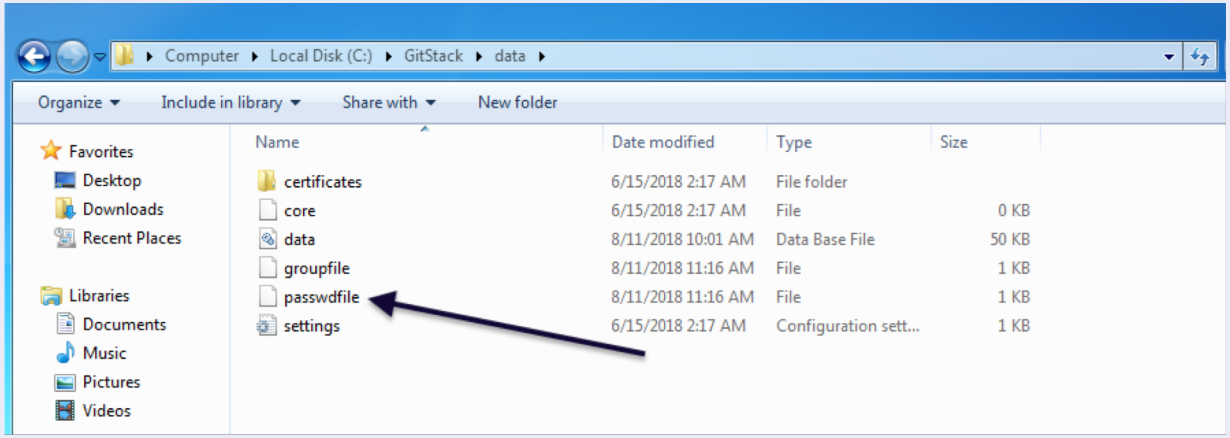
To exploit the vulnerability, the repository web interface must be enabled, a repository must exist, and a user must have access to the repository.

Note: A passwd file should be created by GitStack for local user accounts. Default location: C:\GitStack\data\passwdfile.



Once an attacker adds a user to the server, he can enable the web repository feature.

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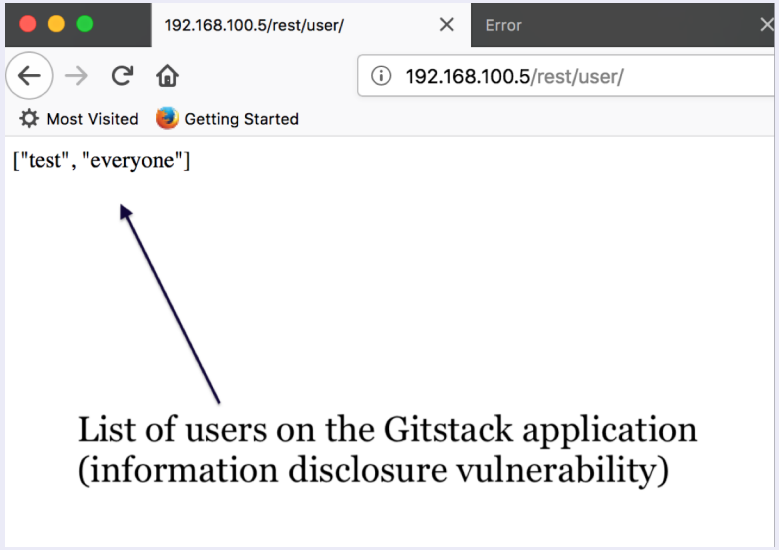
Now, an attacker can create a repository from a remote location and prevent others from accessing our new repository. In the repository, an attacker can upload a backdoor and use it to execute code:

1. View users
Use the GET method to directly view the user list of the GitStack repository, and there is an unauthorized access information disclosure vulnerability.



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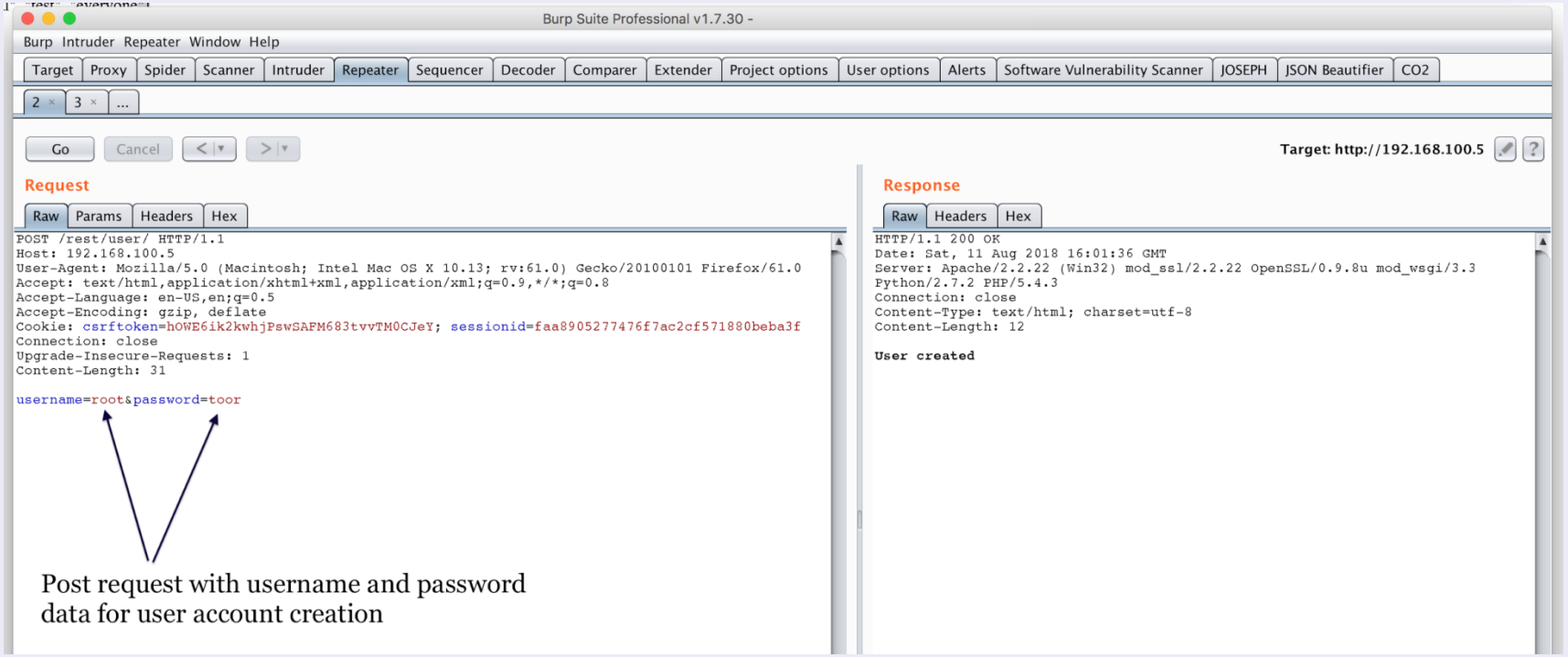
2. Create user

Through the POST method, specifying the username and password can directly add the repository user, and there is any user added vulnerability:



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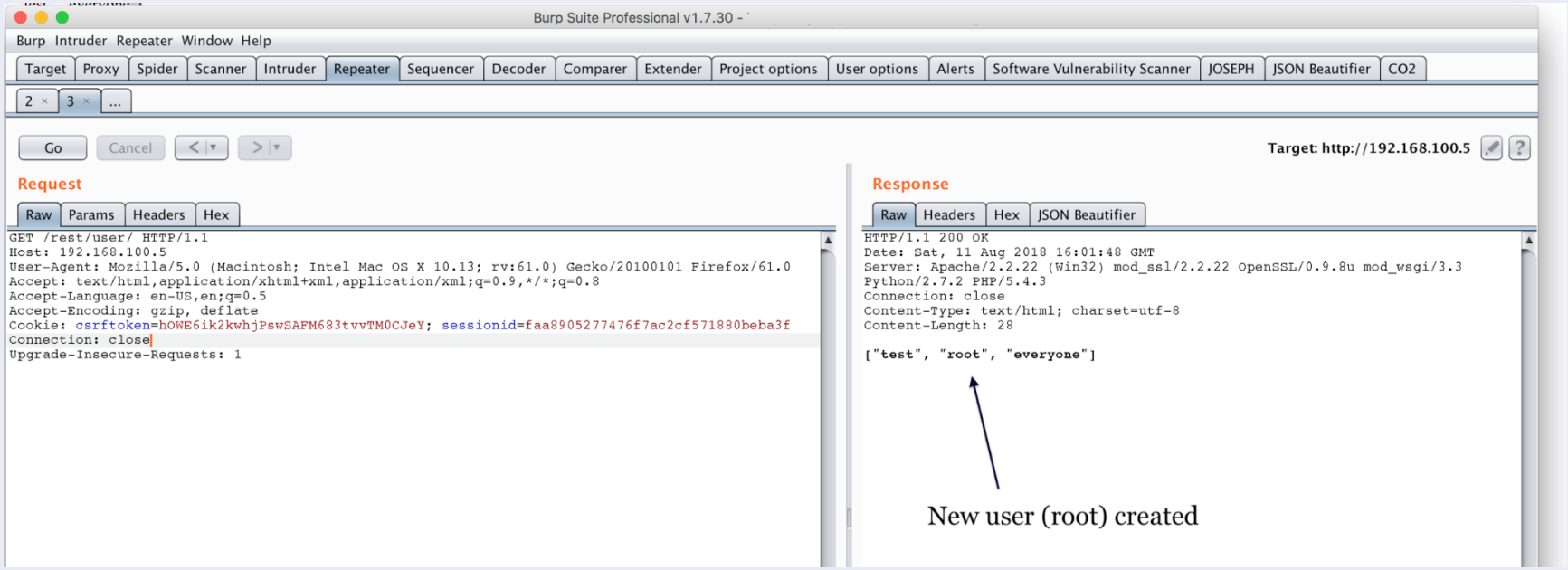
2. Create user



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3. Create a repository arbitrarily

Directly POST a name to create the corresponding project, But CSRF_TOKEN is required in POST data. CSRF_TOKEN is obtained as follows, visit the landing page, such as http://$IP/registration/login/?next=/gitstack/ view the source code:

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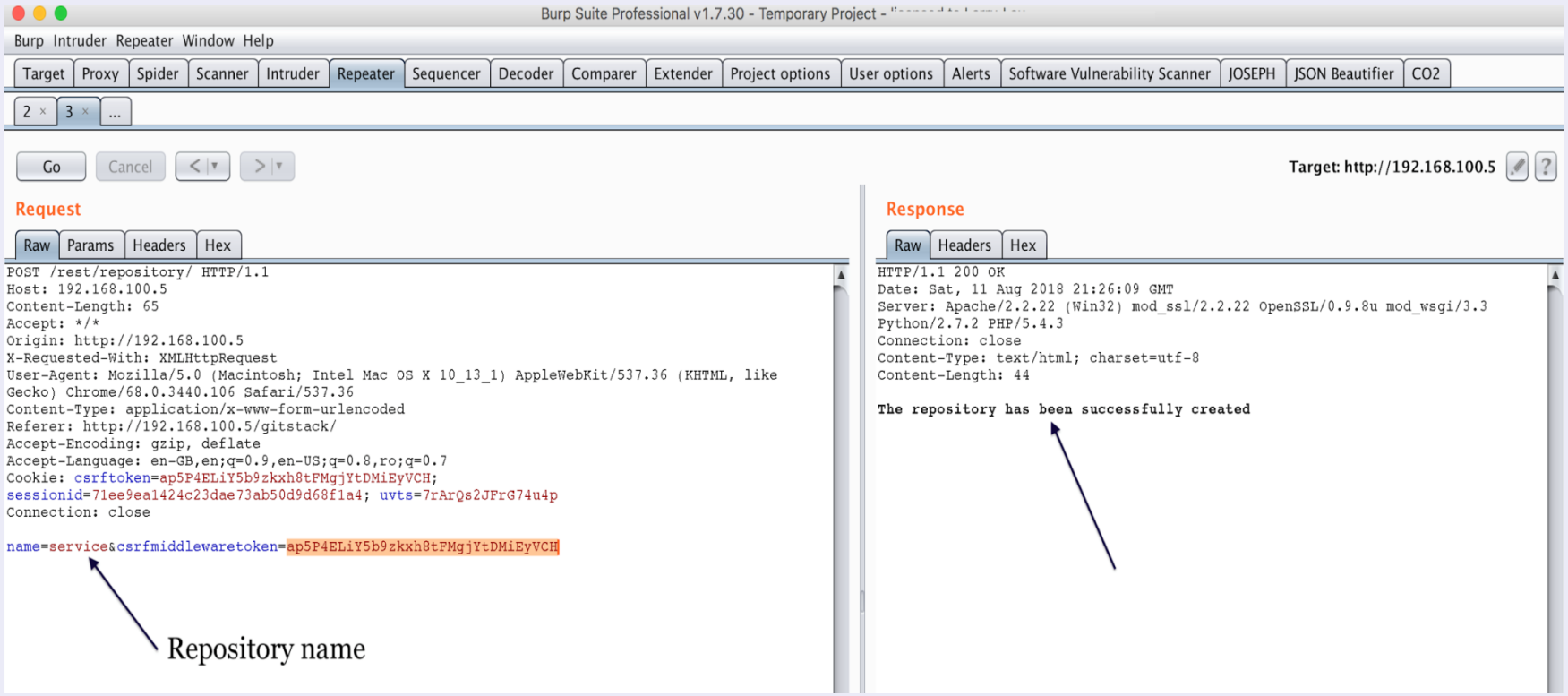
3. Create a repository arbitrarily



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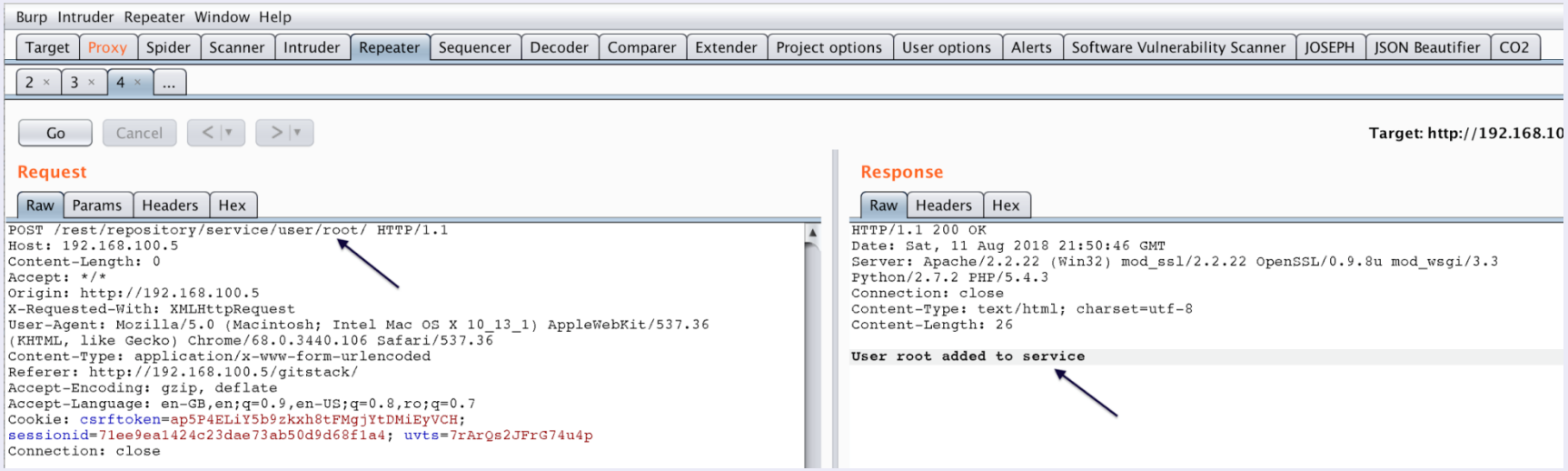
4. Add user to any repository
You can add it by following this format:
POST http://$IP/rest/repository/”repository name”/user/”user name”/



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Remote command execution vulnerability
By default, the GitStack Web Interface is enabled. Access http://xx/web/index.php

An unauthenticated user can upload reverse shell payload to the gitstack repository to compromise the web application and the server hosting it.

DEMO | 5mins

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PROACTIVE REMEDIATION

Focus on development best practices like OWASP Top 10 Application Security Risks – 2017

In this scenario the presenter believes

A2:2017 Broken Authentication

A5:2017 Broken Access Control

A6:2017 Security Misconfiguration

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Thank You

Questions & Answers