

# Web-Application Penetration Testing Report For

Website URL: <a href="http://amplifi.mohua.gov.in/">http://amplifi.mohua.gov.in/</a>

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## **Contributions:**

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# **Key Findings**

- 1. Weak Hashing Algorithm High
- 2. Directory Listing High
- 3. Critical Resource Disclosure High
- 4. DOS Attack High
- 5. TLS/SSL Vulnerability Medium
- 6. Insecure Cookie Attributes Low
- 7. Insecure HTTP Method Low
- 8. Information Disclosure Low
- 9. Using Components with known Vulnerabilities Low
- 10. Default Server Page Accessible Low



## 1. Weak Hashing Algorithm

Incident URL: <a href="https://amplifi.mohua.gov.in/login">https://amplifi.mohua.gov.in/login</a>

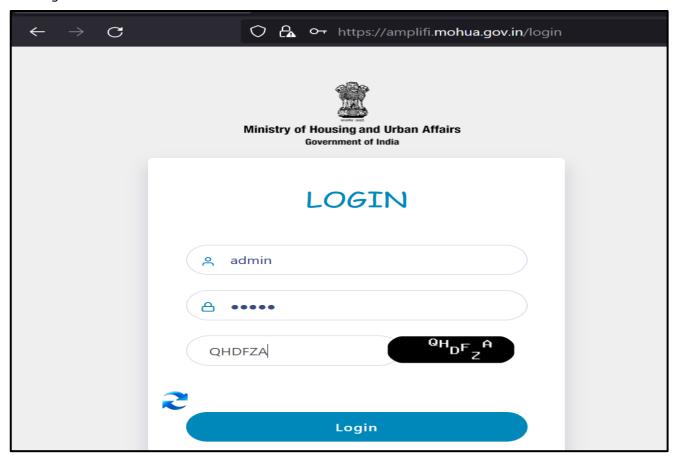
**Description:** The application has not implemented Salted Hashing Technique for the transmitting of password from client to server.

**Impact**: This vulnerability allows an attacker to steal the hashed password and can replay to login to the application.

Severity: High

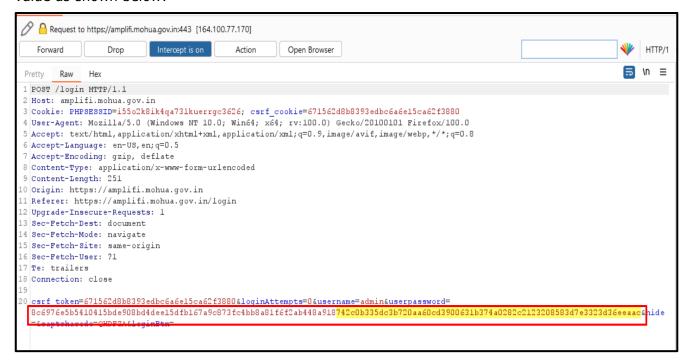
#### **How to Test:**

**Step#1:** A victim user navigates to the application at URL: <a href="https://amplifi.mohua.gov.in/login">https://amplifi.mohua.gov.in/login</a> and login with credential as shown below:





**Step#2:** The login button is clicked, and the request is being captured in an HTTP interceptor. It was observed that the application using simple SHA256 hashing algorithm appended with the salt value as shown below:



**Step#3:** When checked in response it was observed that the application using simple SHA256 hashing algorithm appended with the salt value as shown below:



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**Step#4:** The SHA256 hashed value of the password is shown below.



Same Vulnerability exists in following URL:

https://amplifi.mohua.gov.in/data

https://amplifi.mohua.gov.in/state/login

- 1. Password and Sensitive data should travel in SHA256/512 or encrypted form respectively.
- 2. Password should be always hashed with random salt and salt should be unique for every request.
- 3. Salt should be generated at server side and properly validated.



## 2. Directory Listing

Incident URL: <a href="https://amplifi.mohua.gov.in/icons/">https://amplifi.mohua.gov.in/icons/</a>.

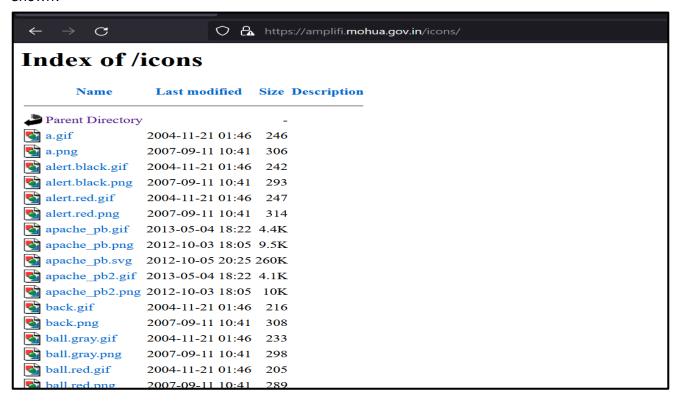
**Description:** An attacker can browse directories of the site and gain access to potentially sensitive data.

**Impact:** An attacker can gain access to sensitive data through directory listing.

Severity: High

#### **How to Test:**

**Step#1:** Upon navigating to the URL: <a href="https://amplifi.mohua.gov.in/icons/">https://amplifi.mohua.gov.in/icons/</a> the following page is shown:



# Recommendation(s):

1. Directory Listing should be disabled for all directories on the website.



#### 3. Critical Resource Disclosure

Incident URL: <a href="https://amplifi.mohua.gov.in/mail.php">https://amplifi.mohua.gov.in/mail.php</a>

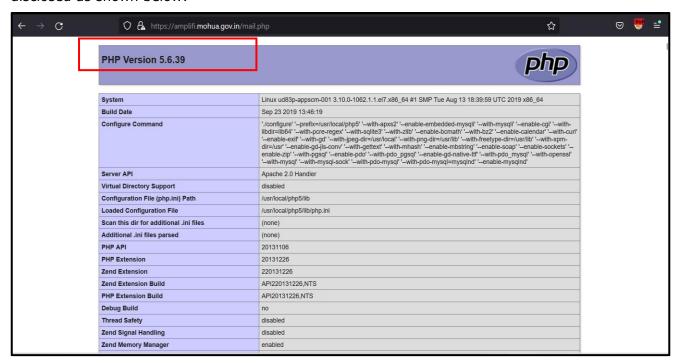
**Description:** An attacker can gain critical information from the critical resource disclosure of the application.

**Impact**: It allows an attacker to use the critical information to carry out known attacks for server.

Severity: High

#### **How to Test:**

**Step#1:** Upon entering the URL: <a href="https://amplifi.mohua.gov.in/mail.php">https://amplifi.mohua.gov.in/mail.php</a> the critical resource is disclosed as shown below:



# Recommendation(s):

1. Application should not disclose the critical resources to the end users.



#### 4. No CAPTCHA - Denial of Service Attack

Incident URL: <a href="https://amplifi.mohua.gov.in/">https://amplifi.mohua.gov.in/</a>.

**Description:** An attacker over the internet can launch an automated denial of service attack against the Feedback page of the application as there is no CAPTCHA present.

**Impact**: An attacker over the internet can launch an automated denial of service attack against the application which can cause unavailability of the resources for genuine user.

**Severity:** High **How to Test:** 

**Step#1:** An attacker navigates to the 'Feedback' Page of the application at URL: <a href="https://amplifi.mohua.gov.in/">https://amplifi.mohua.gov.in/</a> and observes that no CAPTCHA has been implemented:



# Recommendation(s):

The application may restrict such attacks by implementing a CAPTCHA to ensure that no automated attack can be run.

### **CAPTCHA Guidelines:**

- a) CAPTCHA should always be an image.
- b) CAPTCHA value should not travel from server to client side in clear text or any text format.
- c) CAPTCHA should be randomly generated from the server and not from client side.
- d) Strength of CAPTCHA: Minimum of 6 characters, Alpha-numeric and case sensitive.
- e) After each incorrect user credential, the server should return the login page with a new CAPTCHA.



## 5. TLS/SSL Vulnerability

Incident URL: <a href="https://amplifi.mohua.gov.in/">https://amplifi.mohua.gov.in/</a>

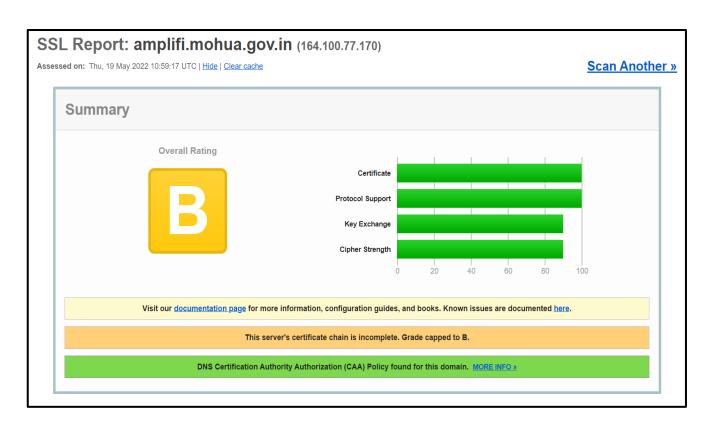
**Description:** The transport layer connection of the application is using weak cipher.

**Impact:** The application is using weak cipher which leads an attacker to perform man-in-the middle attacks.

Severity: Low

#### **How to Test:**

**Step#1:** The following screenshots of the SSL test for the domain: <a href="https://amplifi.mohua.gov.in/">https://amplifi.mohua.gov.in/</a> confirm that the application supports weak cipher as shown below:







- 1. Disable support for all weak/ insecure protocols and completely support TLS 1.2 or greater.
  - 2. Remove all weak and insecure ciphers.



#### 6. Insecure Cookie Attributes

Incident URL: <a href="https://amplifi.mohua.gov.in/">https://amplifi.mohua.gov.in/</a>

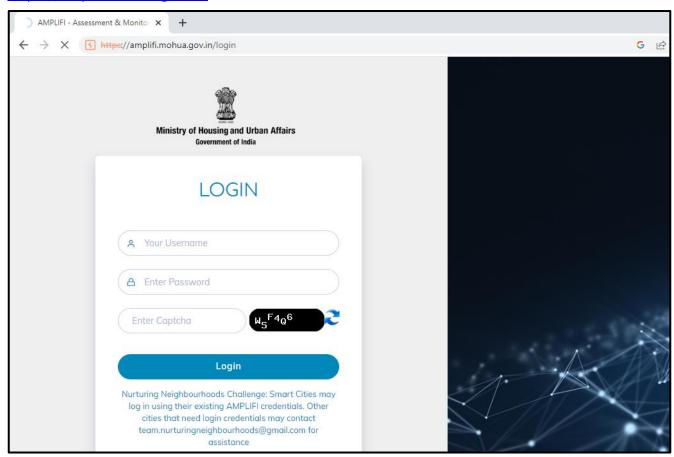
**Description:** The application has not implemented 'Domain' and 'Secure' cookie attributes and 'Path' has been improperly set to root.

**Impact:** This vulnerability allows an attacker to steal sensitive information like session token and allows launching further attacks.

Severity: Low

#### **How to Test:**

**Step#1:** An attacker navigates to the home page of the application at URL: <a href="https://amplifi.mohua.gov.in/">https://amplifi.mohua.gov.in/</a>.





**Step#2:** Upon intercepting the response, it was observed that domain and secure cookie attribute is not used, and path is set to root.

```
rarget: nttps://ampiiri.monua.gov.in
     Response
=
                                                                                                  ١n
      Pretty
               Raw
                       Hex
                               Render
        HTTP/1.1 200 OK
       2 Date: Tue, 10 May 2022 06:57:13 GMT
       3 Server: Apache/2.4.6 (Red Hat Enterprise Linux) PHP/5.6.39 OpenSSL/1.0.2k-fips
       4 X-Powered-By: PHP/5.6.39
      5 Expires: Thu, 19 Nov 1981 08:52:00 GMT
6 Cache-Control: no-store, no-cache, must-revalidate, post-check=0, pre-check=0
       7 Pragma: no-cache
        Set-Cookie: csrf_cookie=debldaca53e22d260141d7d75d7b3593; expires=Tue, 10-May-2022
         07:09:13 GMT; Max-Age=720; path=/; httponly
        X-Frame-Options: SAMEORIGIN
     10 Connection: close
     11 Content-Type: text/html; charset=UTF-8
     12 Content-Length: 13242
     14 <!DOCTYPE html>
     15 <html class="loading" lang="en" data-textdirection="ltr">
           <!-- BEGIN: Head-->
     18
     19
             <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
             <meta http-equiv="X-UA-Compatible" content="IE=edge">
     20
             <meta name="viewport" content="width=device-width, initial-scale=1.0,</pre>
     21
             user-scalable=0, minimal-ui">
             <meta name="description" content="">
     22
             <meta name="keywords" content="">
```

- 1. 'Path' should not set to root Instead a sub folder path should be used.
- 2. Also, the "Domain" cookie attribute should be set as restrictive as possible and the complete application domain should be provided for this attribute.
- 3. The application should set 'Domain', 'HTTP Only' & 'Secure' cookie attributes for both pre authentication Session ID and post authentication Session ID in the application.



#### 7. Insecure HTTP Method

Incident URL: <a href="https://amplifi.mohua.gov.in/">https://amplifi.mohua.gov.in/</a>

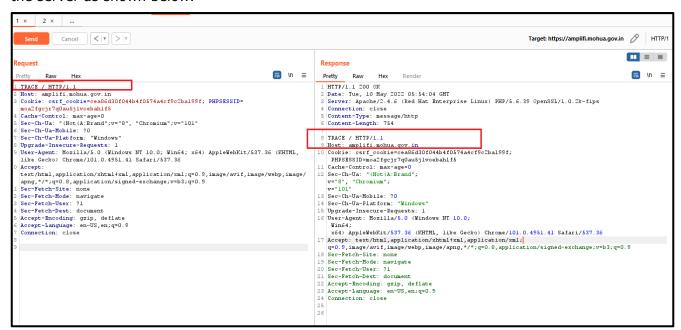
**Description:** The insecure 'TRACE' HTTP method is enabled in the application.

**Impact:** It allows an attacker to perform further attacks based on the HTTP methods which are enabled.

Severity: Low

#### **How to Test:**

**Step#1:** An attacker browses the page of the web services at URL: <a href="https://amplifi.mohua.gov.in/">https://amplifi.mohua.gov.in/</a>, intercepts in the HTTP interceptor and send a "TRACE" request to the server as shown below.



# Recommendation(s):

1. It is recommended to allow only GET, POST and HEAD HTTP methods.



#### 8. Information Disclosure

Incident URL: <a href="https://amplifi.mohua.gov.in/">https://amplifi.mohua.gov.in/</a>.

**Description:** An attacker can gain server-side information like server and framework name and version from the HTTP response of the application.

**Impact:** An attacker can gain server-side information like server name from the HTTP response of the application that may allow an attacker to carry out specific known targeted attacks for remote server.

Severity: Low

#### **How to Test:**

Enter the URL: <a href="https://amplifi.mohua.gov.in/">https://amplifi.mohua.gov.in/</a>.

**Instance#1:** The below response which was captured in an HTTP interceptor shows that the application discloses server and framework name and versions.

```
Response from https://amplifi.mohua.gov.in:443/ [164.100.77.170]
   Forward
                              Intercept is on
                                               Action
                   Drop
                                                           Open Browser
Pretty
        Raw
              Hex
                     Render
 1 HTTP/1.1 200 OK
 Server: Apache/2.4.6 (Red Hat Enterprise Linux) PHP/5.6.39 OpenSSL/1.0.2k-fips
 4 X-Powered-By: PHP/5.6.39
 6 Cache-Control: no-store, no-cache, must-revalidate, post-check=0, pre-check=0
 7 Pragma: no-cache
 8 Set-Cookie: csrf_cookie=7683a65eeb45c468839b54e56cbd194c; expires=Mon, 23-May-2022 14:07:36 GM
 9 X-Frame-Options: SAMEORIGIN
10 Connection: close
11 Content-Type: text/html; charset=UTF-8
12 Content-Length: 46093
13
14 <!DOCTYPE html>
15 <html lang="en-US">
16
17
18
     <head>
19
       <meta charset="utf-8" />
       <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no" />
20
```



- 1. The application should not display server and framework related information to the application users.
- 2. The server banner must be removed from the server.



## 9. Using Components with known Vulnerabilities

Incident URL: <a href="https://amplifi.mohua.gov.in/assets/js/jquery">https://amplifi.mohua.gov.in/</a>

**Description:** The application is using vulnerable version of jQuery and Apache (3.3.1/3.3.6)

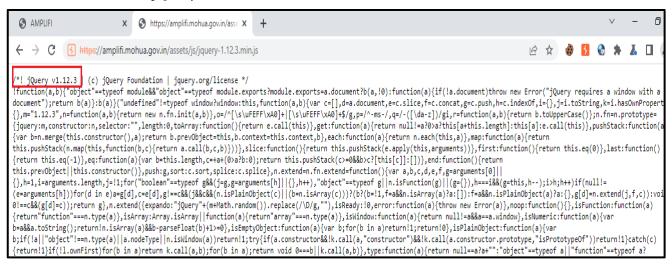
**Impact**: The application is using vulnerable versions of jQuery and Apache because of which an attacker can possibly exploit already known vulnerabilities.

Severity: Low

#### **How to Test:**

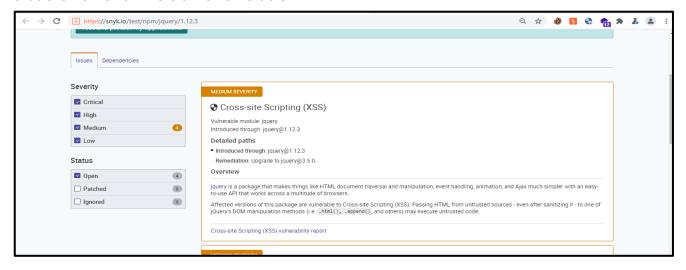
#### Instance#1: jQuery v1.12.3

**Step#1:** A malicious user navigates to the view source page of the application at URL:view-source: https://amplifi.mohua.gov.in/assets/js/jquery and observes that the application is using vulnerable version of jQuery as shown below:





**Step 2:** The attacker checks for the 'synk' details for the same i.e., 'jQuery v1.12.3' and finds that the framework version is vulnerable.



#### Instance#2: Apache 2.4.6

**Step#1:** A malicious user navigates to the view source page of the application at URL: <a href="https://amplifi.mohua.gov.in/">https://amplifi.mohua.gov.in/</a> and observes that the application is using vulnerable version of Apache 2.4.6 as shown below:

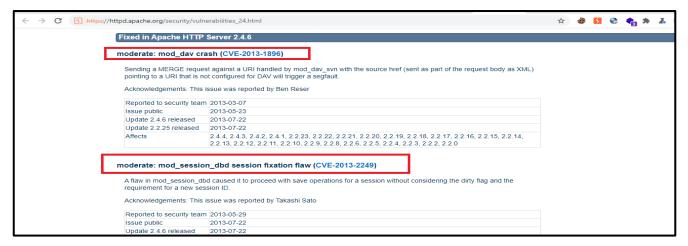
```
Target: https://amplifi.mohua.gov.in
                                                                                                   HTTP/
                                                                                             Response
                                                                                              ⇒ \n
Pretty
         Raw
                         Render
 1 HTTP/1.1 200 OK
 2 Date: Tue, 10 May 2022 04:29:16 GMT
 Server: Apache/2.4.6 (Red Hat Enterprise Linux) PHP/5.6.39 OpenSSL/1.0.2k-fips 4 X-Powered-By: PHP/5.6.39
5 Expires: Thu, 19 Nov 1981 08:52:00 GMT
 6 Cache-Control: no-store, no-cache, must-revalidate, post-check=0, pre-check=0
 7 Pragma: no-cache
8 Set-Cookie: csrf_cookie=cea86d30f044b4f0574a4cf9c2bal99f; expires=Tue, 10-May-2022 04:41:16 GMT;
   Max-Age=720; path=/; httponly
 9 X-Frame-Options: SAMEORIGIN
10 Connection: close
11 Content-Type: text/html; charset=UTF-8
12 Content-Length: 46093
13
14 <!DOCTYPE html>
15 <html lang="en-US">
16
17
18
     <head>
19
       <meta charset="utf-8" />
       <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no" />
20
       <meta name="discrption" content="parallax one page" />
21
       <meta name="keyword"
content=" " />
22
23
24
       <!-- Title -->
```

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#### Step 2:

The attacker checks for the 'cve' details for the same i.e., 'Apache 2.4.6' and finds that the server version is vulnerable.



## **Recommendation(s):**

1. The application must use the latest stable version of framework for jQuery and Apache or patch and update the components on regular basis.



## 10. Default Server Page Accessible

Incident URL: <a href="https://amplifi.mohua.gov.in/manual/">https://amplifi.mohua.gov.in/manual/</a>

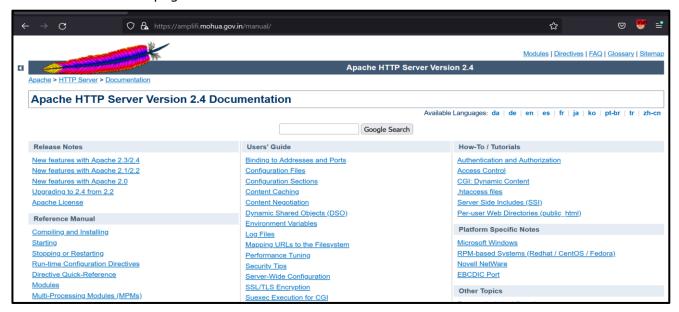
**Description:** The Default Server Administrative page is accessible over the internet.

**Impact**: An attacker can access the server management console and can gain unauthorized access to application and configurations controls.

Severity: Low

#### **How to Test:**

**Step#1:** On navigating the following URL: <a href="https://amplifi.mohua.gov.in/manual/">https://amplifi.mohua.gov.in/manual/</a>, the default server administrative page is accessible.



## **Recommendation(s):**

- 1. It is recommended that the Default Server page should be restricted and should not be accessible over the internet.
- 2. It should be IP restricted for the authorized individuals only.

Note: Vulnerabilities should be patched throughout the website.