Chamilo LMS 1.11.x Vulnerabilities Write-up

Overview

In the past week I've looked deeper into Chamilo LMS to work on my white-box skills and found some vulnerabilities which I reported to the vendor:

- Authenticated RCE/LFI in user import via XML External Entity - CVE-2021-32925
- Unauthenticated SQL Injection in "compilatio" module - CVE-2021-35414
- Admin authenticated SQL injection vulnerability in sessions
- Multiple stored cross-site scripting vulnerabilities - CVE-2021-35415
- Unauthenticated SQL Injection #2 in plugin - CVE-2021-35414
- Authenticated Remote Code Execution in import file - CVE-2021-35413

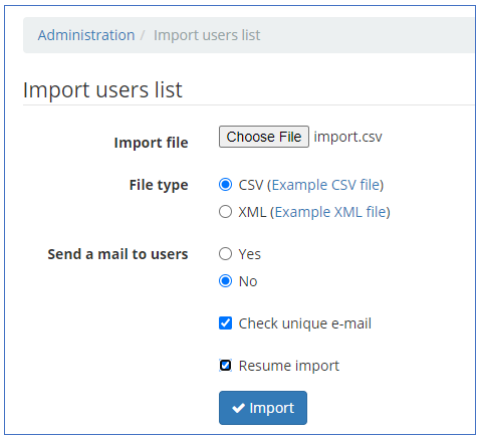
Authenticated RCE/LFI in user import via XML External Entity - CVE-2021-32925

Affected versions: 1.11.x

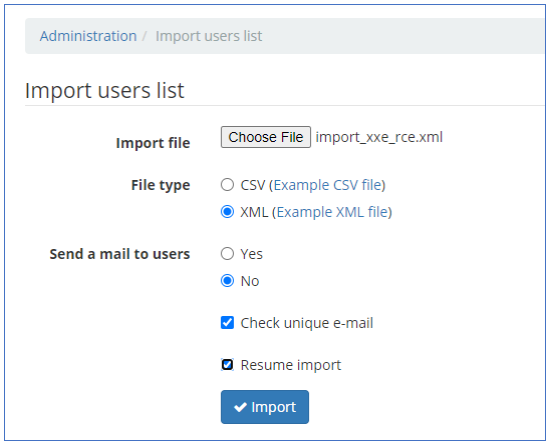
Authenticated admins can exploit XEE vulnerability and trigger in-band Local File Inclusion when importing users using XML file on multiple places. If expect wrapper is installed on the target box, code can be executed remotely.

How to reproduce

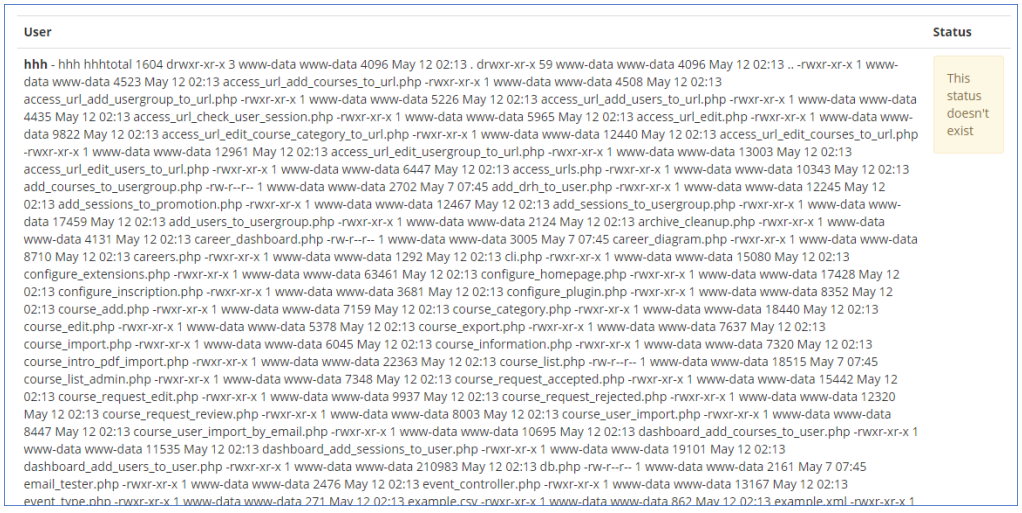
Following example shows how to exploit the vulnerability in '/main/admin/user_import.php'. Because of an unknown issue a dummy CSV file needs to be imported to see the in-band errors later:



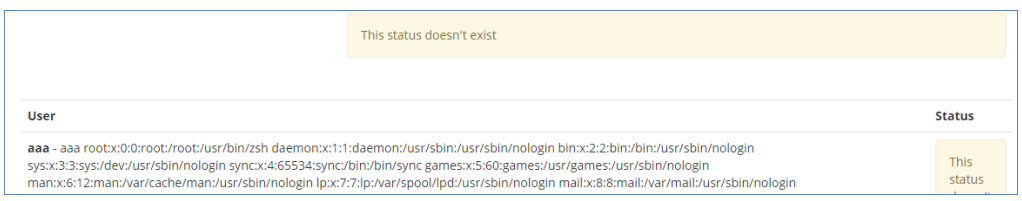
After that, the XML with XEE payload can be uploaded:



The import will fail, but the error message will contain in-band XEE RCE output if expect wrapper is installed (in the example, ls -la was executed):



Another example is to load inband `/etc/passwd` file using LFI:



Mitigation

Update to the latest release of Chamilo LMS. Following is the specific fix - Commit e71437c8de809044ba3ae1b181d70857c050a3e9

Timeline

- 2021-05-12 Reported to vendor
- 2021-05-12 Fixed by vendor (in less than 9 hours)
- 2021-05-13 Requested CVE ID by me
- 2021-05-14 Issued CVE-2021-32925

References

- https://support.chamilo.org/projects/1/wiki/Security_issues#Issue-58-2021-05-12-High-impact-very-low-risk-LFIRCE-vulnerability-in-users-import
- https://cve.mitre.org/cgi-bin/cvename.cgi?name=cve-2021-32925

Unauthenticated SQL Injection in "compilatio" module

CVE-2021-35413

Affected versions: 1.11.14

There is a SQL Injection vulnerability that allows unauthenticated attackers to run arbitrary queries when the system has „compilatio“ module enabled. The issue is in `main/plagiarism/compilatio/upload.php`, where the `doc` parameter isn't properly santitized:

```
84  } else {
85      $documentId = isset($_GET['doc']) ? $_GET['doc'] : 0;
86      sendDocument($documentId, $courseInfo);
```

and is later included directly into the sql query string:

```
95      $query = "SELECT * FROM $workTable
96                WHERE id = $documentId AND c_id= $courseId";
97      $sqlResult = Database::query($query);
```

How to reproduce

An example attack URL is http://chamilo/main/plagiarism/compilatio/upload.php?doc=123%20or%20sleep(10);--#

Mitigation

Update to the latest release of Chamilo LMS. Following is the specific fix - Commits 36149c1ff99973840a809bb865f23e1b23d6df00 and f398b5b45c019f873a54fe25c815dbaaf963728b

Timeline

- 2021-05-13 Reported to vendor
- 2021-05-13 Fixed by vendor
- 2021-12-04 Issued CVE-2021-35414

References

- https://support.chamilo.org/projects/1/wiki/Security_issues#Issue-59-2021-05-13-High-impact-low-risk-Unauthenticated-SQL-injection-vulnerability-when-a-module-is-enabled

Admin authenticated SQL injection vulnerability in sessions

Affected versions: 1.11.x

Another SQL Injection vulnerability which allows authenticated admins to run arbitrary queries and receive in-band responses.

The vulnerable endpoint is at `/main/session/session_add.php`.

The `xajaxargs[]` parameter should contain the payload, which will do union select to leak username, password and salt from the users table. (The query needs to be NULL-byte terminated to pass syntax checks).

The search parameter is passed to the `seach_coachs` function, which doesn't escape it via `Database::escape_string` before using it in the SQL string:

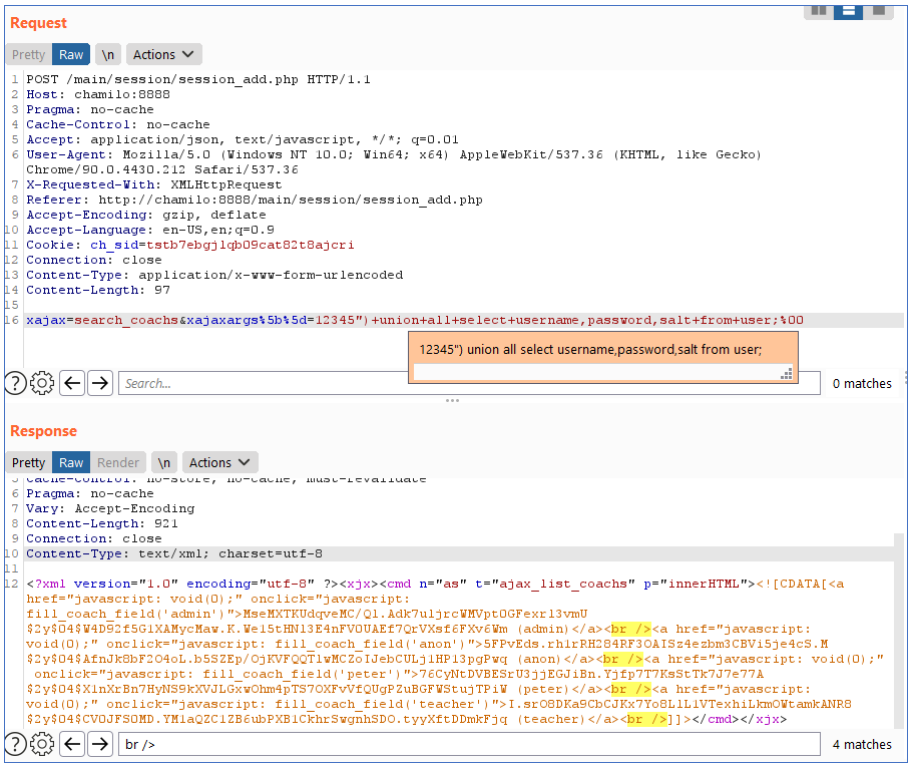
```
function search_coachs($needle)
{
    $tbl_user = Database::get_main_table(TABLE_MAIN_USER);
    $xajax_response = new xajaxResponse();
    $return = '';

    if (!empty($needle)) {
        $order_clause = api_sort_by_first_name() ? ' ORDER BY firstname, lastname, username' : ' ORDER BY lastname, firstname, username';

        // search users where username or firstname or lastname begins likes $needle
        $sql = 'SELECT username, lastname, firstname
                FROM '.$tbl_user.' user
                WHERE (username LIKE "'.$needle.'%"
                OR firstname LIKE "'.$needle.'%"
                OR lastname LIKE "'.$needle.'%")
                AND status=1'.
            $order_clause.
            ' LIMIT 10';
```

How to reproduce

Pass null-byte terminated argument in the `xajaxargs[]` parameter:



Mitigation

Update to the latest release of Chamilo LMS. Following is the specific fix - Commit 93ed46451927dd7d5826cde9e08a2b438b9220e0

Timeline

- 2021-05-13 Reported to vendor
- 2021-05-14 Fixed by vendor

References

- https://support.chamilo.org/projects/1/wiki/Security_issues#Issue-60-2021-05-13-High-impact-very-low-risk-SQL-injection-vulnerability-in-sessions-requires-admin-perms

Multiple stored cross-site scripting vulnerabilities

CVE-2021-35415

Affected versions: 1.11.x

There were multiple stored XSS vulnerabilities found

How to reporoduce

XSS01 The course name is vulnerable to stored XSS (admin access required)

Course title doesn't have double quotes properly escaped, therefore it's possible to inject XSS as the title is displayed as alt for images.

Payload for title is: `test1xxxxx" onload="alert(1)`

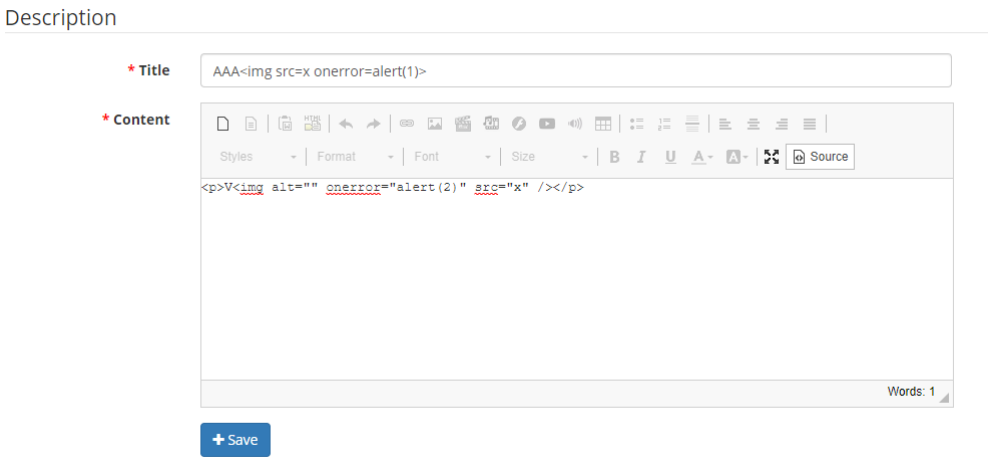
Which triggers in `/user_portal.php` :

and also in `/index.php` :

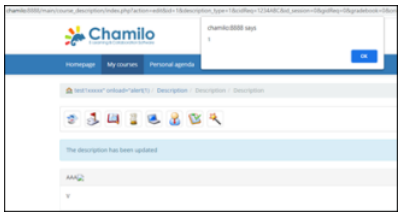
and `/main/auth/sort_my_courses.php` :

and finally also on the login screen:

XSS02 The course description and title are vulnerable to stored XSS (teacher access required) Course description can be simply edited in the source code mode and xss code added. The title is vulnerable as well



It will trigger for title:



and for description:

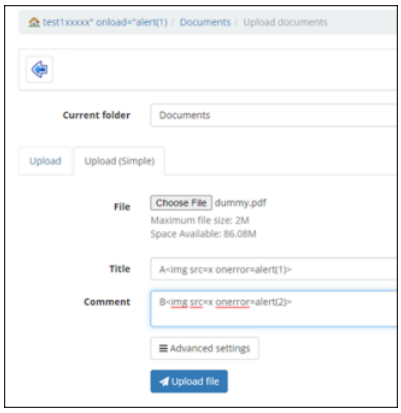
The code gets triggered also in the student view:

XSS03 XSS in course documents (student access required)

Not disclosing as fix will be provided in version 2.0

XSS04 Document upload – Title is vulnerable to XSS

When documents are uploaded, the title isn't properly sanitized



Triggers when Documents are listed:

Mitigation

Update to the latest release of Chamilo LMS. Following are is the specific fixes:

- XSS1 by commitfd54f6194285f949c86060d3b2a7967b43689480
- XSS2 by commit19189a91d1eac9aa204b9439b82e3e73c8ac2e03
- XSS4 by commitcf84be1ca1d9a08ad1341dfbf8df475b13a89072

Timeline

- 2021-05-14 Reported to vendor
- 2021-05-14 Fixed by vendor
- 2021-12-04 Issued CVE-2021-35415

References

- https://support.chamilo.org/projects/1/wiki/Security_issues#Issue-61-2021-05-14-Low-impact-very-low-risk-XSS-in-course-name
- https://support.chamilo.org/projects/1/wiki/Security_issues#Issue-62-2021-05-14-Low-impact-low-risk-XSS-in-course-description
- https://support.chamilo.org/projects/1/wiki/Security_issues#Issue-63-2021-05-14-Low-impact-moderate-risk-XSS-in-course-documents
- https://support.chamilo.org/projects/1/wiki/Security_issues#Issue-64-2021-05-14-Low-impact-low-risk-XSS-in-course-document-title-on-upload

Unauthenticated SQL Injection #2 in plugin

CVE-2021-35414

Affected versions: 1.11.x

There is a plugin with its own web service, which has the authentication vulnerable to SQL injection in password parameter (plugin doesn't need to be enabled to trigger the SQL injection).

How to reproduce

Following request will trigger the SQL Injection:

This is because the parameters will be passed to authenticate method:

```php
$doc = new DOMDocument();
$post = file_get_contents('php://input');
if (!empty($post)) {
    $doc->loadXML($post);

    $WSUser = $doc->getElementsByTagName('Username')->item(0)->nodeValue;
    $WSKey = $doc->getElementsByTagName('Password')->item(0)->nodeValue;

    $s = new WSSESoapServer($doc);
    if (!empty($WSUser) && !empty($WSKey)) {
        if (authenticate($WSUser, $WSKey)) {
```

which will sanitize only the login, leaving password vuln:

```php
function authenticate($WSUser, $WSKey)
{
    $tUser = Database::get_main_table(TABLE_MAIN_USER);
    $tApi = Database::get_main_table(TABLE_MAIN_USER_API_KEY);
    $login = Database::escape_string($WSUser);
    $sql = "SELECT u.user_id, u.status FROM $tUser u, $tApi a
            WHERE
                u.username='".$login."' AND
                u.user_id = a.user_id AND
                a.api_service = 'dokeos' AND
                a.api_key='".$WSKey."'";
    $result = Database::query($sql);
```

Mitigation

Update to the latest release of Chamilo LMS. Following is the specific fix - Commit 6a98e32bb04aa66cbd0d29ad74d7d20cc7e7e9c5

Timeline

- 2021-05-15 Reported to vendor
- 2021-05-17 Fixed by vendor
- 2021-12-04 Issued CVE-2021-35414

References

- https://support.chamilo.org/projects/1/wiki/Security_issues#Issue-65-2021-05-15-High-impact-very-high-risk-Unauthenticated-SQL-injection-in-plugin

Authenticated Remote Code Execution in import file

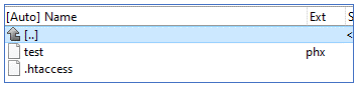
CVE-2021-35413

Affected versions: 1.11.x

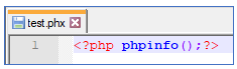
It is possible to upload zip-file containing `.htaccess` file when using the `course_intro_pdf_import.php` import functionality.

How to reproduce

The contents of the zip-file:



contents of `test.phx` - php code to execute:



`.htaccess` with add php handler for `.phx` file extensions:

```
htaccess
1  AddHandler application/x-httpd-php .phx
2
```

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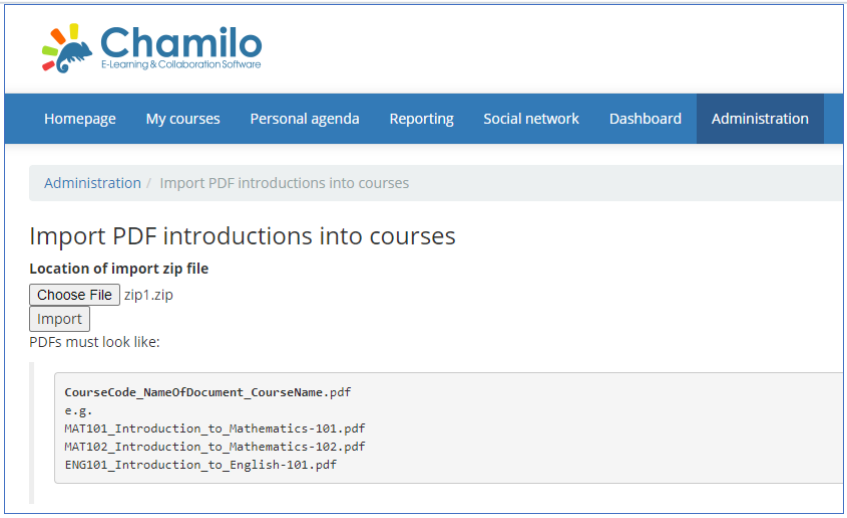

The contents of the zip file will be put in folder `/var/www/chamilo/app/cache/pdfimport` :

```
www-data@l0calh0st:~/chamilo/app/cache/pdfimport$ ls -la
total 16
drwxr-xr-x 2 www-data www-data 4096 May 15 12:27 .
drwxr-xr-x 8 www-data www-data 4096 May 15 12:15 ..
-rw-r--r-- 1 www-data www-data   41 May 15  2021 .htaccess
-rw-r--r-- 1 www-data www-data   18 May 15  2021 test.phx
```

And the `.phx` code can be executed by calling `/app/cache/pdfimport/test.phx`

Mitigation

Update to the latest release of Chamilo LMS. Following is the specific fix - commits 2e5c004b57d551678a1815500ef91524ba7bb757, 8ba572397445477d67ca55453fd8f29885bb19e5, 905a21037ebc9bc5369f0fb380177cb56f496f5c

Timeline

- 2021-05-15 Reported to vendor
- 2021-05-17 Fixed by vendor
- 2021-05-19 Reported another attack vector (race condition)
- 2021-05-20 Fixed by vendor
- 2021-12-04 Issued CVE-2021-35413

References

- https://support.chamilo.org/projects/1/wiki/Security_issues#Issue-66-2021-05-21-High-impact-very-low-risk-Authenticated-RCE-in-accessory-script