

MUAZ KHAN

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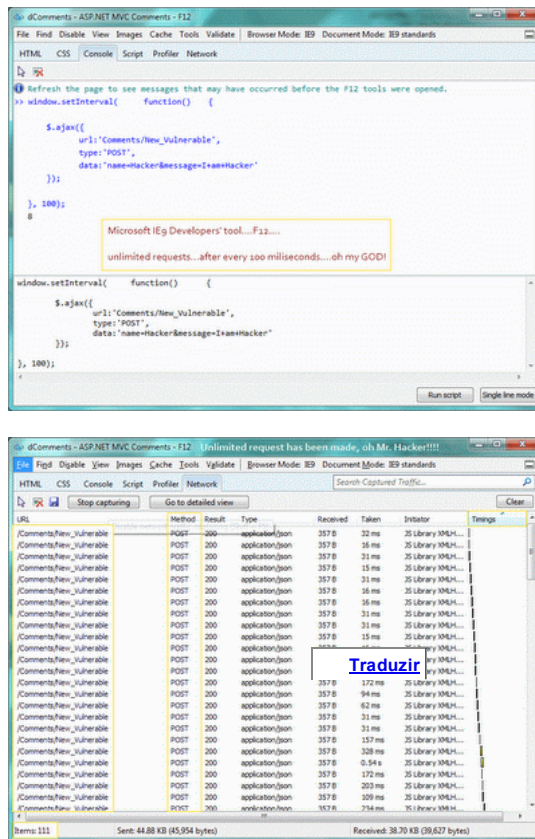
ASP.NET MVC security and hacking: Defense-in-depth

In this post, I'll try to explore some common and well-known attacks and hacking techniques regarding ASP.NET MVC web app.

Note: *ASP.NET MVC 4* shipped with the support of HTML Sanitization and Anti-XSS libraries. So now you can easily protect your website against a lot of well-known XSS/CSRF attacks.

Cross-Site Scripting (XSS) attack

In simple words, injection of malicious scripts via input. Here is how to attack a JSON request.



Don't forget to check the database table after the attack!

Identity	Name	Message	EventDate
1071	Muaz Khan	My name is Mu...	4/29/2011 6:05...
1072	Muaz Khan	Hi Saqib, There ...	4/29/2011 6:08...
1093	Hacker	I am Hacker	4/29/2011 3:45...
1094	Hacker	I am Hacker	4/29/2011 3:45...
1095	Hacker	I am Hacker	4/29/2011 3:45...
1096	Hacker	I am Hacker	4/29/2011 3:45...
1097	Hacker	I am Hacker	4/29/2011 3:45...
1098	Hacker	I am Hacker	4/29/2011 3:45...
1099	Hacker	I am Hacker	4/29/2011 3:45...
1100	Hacker	I am Hacker	4/29/2011 3:45...
1101	Hacker	I am Hacker	4/29/2011 3:45...
1102	Hacker	I am Hacker	4/29/2011 3:45...
1103	Hacker	I am Hacker	4/29/2011 3:45...
1104	Hacker	I am Hacker	4/29/2011 3:45...
1105	Hacker	I am Hacker	4/29/2011 3:45...
1106	Hacker	I am Hacker	4/29/2011 3:45...
1107	Hacker	I am Hacker	4/29/2011 3:45...
1108	Hacker	I am Hacker	4/29/2011 3:45...
1109	Hacker	I am Hacker	4/29/2011 3:45...
1110	Hacker	I am Hacker	4/29/2011 3:45...
1111	Hacker	I am Hacker	4/29/2011 3:45...
1112	Hacker	I am Hacker	4/29/2011 3:45...
1113	Hacker	I am Hacker	4/29/2011 3:45...
1114	Hacker	I am Hacker	4/29/2011 3:45...

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2

WebRTC Experiment

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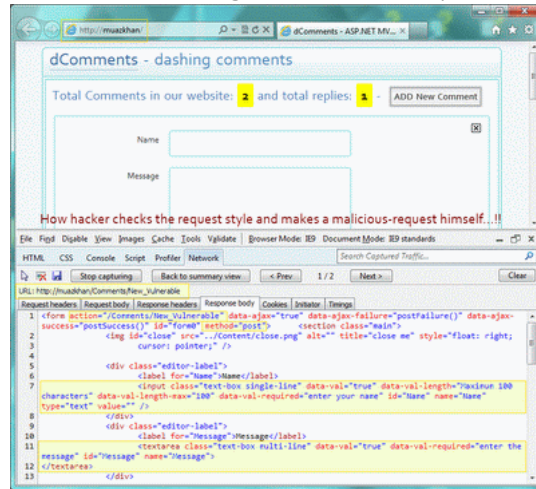
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How hacker start attacks?

Actually hacker uses a lot of tools including web-browsers' developers tools to hack websites.



Hacker checks the:

- **Posting-Url** ---- i.e. form-action (Http POST, GET, DELETE etc.)
- **Number of parameters and their types** ---- required or optional

As above figure shows that:

- **Posting-Url:** http://muazkhan.com/comments/new_vulnerable
- **Parameters:** 1) Name 2) Message
- There is no Anti-Forgery token

The absolute URL of the request is:

http://muazkhan.com/comments/new_vulnerable?name=something&message=something

Also hacker can make unlimited requests that cause the Denial of Service (DoS) attack or Buffer Overrun attack.

Another XSS Attack: Redirect User to hacker's webpage

I suggest you never allow HTML in the input and [use Wiki Mark-up](#) instead!

Here is how you are vulnerable if you allow HTML in the input:

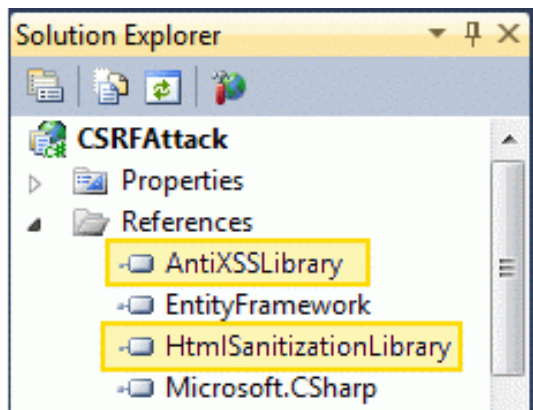
```
<script>
  (function ()
  {
    location = 'http://hacker.com';
  }) ();
</script>
```

What has happened? The hacker has injected a malicious script via input and if this is a comments section or discussion forum then on each page load user is redirected to hackers given webpage!

Security against XSS attacks?

ASP.NET MVC 4 natively supports below mentioned libraries however for old version, you've to reference them yourself and their usage is highly recommended because these libraries are well-designed to help protect given input from well-known XSS/CSRF attacks.

- [Anti XSS Library \(for .NET\)](#)
- [HTML Sanitization Library \(for .NET\)](#)



Some good rules for avoiding XSS attacks

These rules are taken from <http://www.educatedguesswork.org/>.

- Untrusted data MUST NOT be transmitted in the same HTTP responses as HTML or JavaScript. In particular, the main HTML document SHOULD be static (and therefore cacheable for a long time).
- When transmitted from the server to the client, untrusted data MUST be properly encoded in JSON format and the HTTP response MUST have a Content-Type of application/json.
- When introduced into the DOM, untrusted data MUST be introduced using one of the following APIs:
 - 1) Node.textContent 2) document.createTextNode 3) Element.setAttribute (second parameter only)

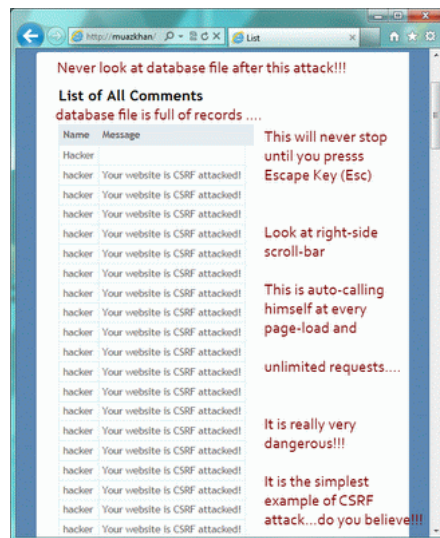
Cross-Site Request Forgery (CSRF) Attack

First of all, please [Download](#) the demo project and try CSRF attacking yourself.

```
<html>
  <body onload="document.CSRF.submit()">
    <form name="CSRF" method="POST" action="Home/New">
      <input type="hidden" name="Name" value="hacker" />
      <input type="hidden" name="Message" value="Your website is CSRF attacked!" />
    </form>
  </body>
</html>
```

Copy above HTML code and paste into the **Message** textarea:





Security against CSRF attacks

You need to use [AntiXSSLibrary](#) or [HtmlSanitizationLibrary](#) for security against XSS (Cross-Site Scripting) attacks as well as CSRF or XSRF (Cross-Site Request Forgery) attacks.

```
comment.Message = Sanitizer.GetSafeHtml(comment.Message);
```

After using above mentioned libraries, hacker's malicious-code is no-more malicious:

```
<html>
  <body onload="document.CSRF.submit()">
    <form name="CSRF" method="POST" action="Home/New">
      <input type="hidden" name="Name" value="hacker" />
      <input type="hidden" name="Message" value="Your website is CSRF attacked!" />
    </form>
  </body>
</html>
```

The method (`Sanitizer.GetSafeHtml(...)`) transforms and filters HTML of executable scripts. A safe list of tags and attributes are used to strip dangerous scripts from the HTML. HTML is also normalized where tags are properly closed and attributes are properly formatted.

ValidateAntiForgeryToken attribute and CSRF attacks

`ValidateAntiForgeryToken` attribute helps protect you against CSRF attacks but not protect you against XSS attacks, so please use it with conjunction to [AntiXSSLibrary](#) and [HtmlSanitizationLibrary](#).

```
using Microsoft.Security.Application;
```

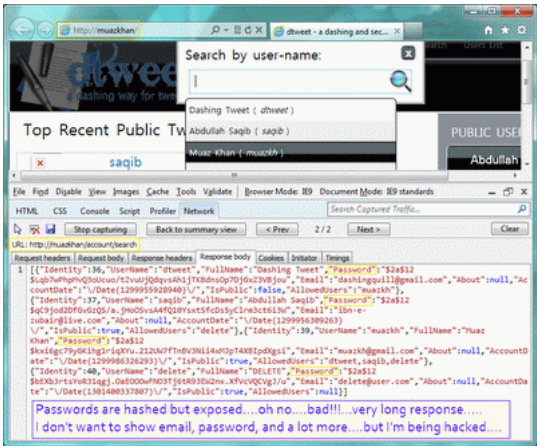
```
[HttpPost, ValidateInput(enableValidation:false), ValidateAntiForgeryToken]
public ActionResult New(Comment comment)
{
    comment.Message = Sanitizer.GetSafeHtml(comment.Message);
    _comments.Add(comment); _comments.Save();
    return RedirectToAction("List");
}
```

```
@using (Html.BeginForm()) {
    @Html.AntiForgeryToken()
    ...
}
```

```
<input name="__RequestVerificationToken" type="hidden" value="BvzGsNxa0Jmrw5XZfMIIsPFyt0qNac0LYxJqBjiOahrnGvG7+Uh9qXckeF6iVa7i"
```

Common Mistakes or Common Security Holes

In this section, we'll try to know how our common coding mistakes help the hacker to see our secure data or data that we never want to show. We'll use an Open-Source project: [dtweet](#), to know how our secure data is exposed to hacker:



[BCrypt](#) library helped me hash the password; however, please do your best to protect your code against known and possible attacks. Right! Following code shows what was my mistake and how I can mitigate the risk:

```
public JsonResult Search() /* Exposed to Hack */
{
    /* I am passing whole 'Users' object */
    return Json(new dtweetDataContext().Users);
}

public JsonResult Search() /* Secured */
{
    /* I am passing required fields only, not whole object!! */
    return Json(new dtweetDataContext().Users.Select(u => new {u.UserName, u.FullName}));
}
```

And now hacker is being shamed:



Some good Rules

- Never, ever trust any data your users give you. Ever.
- It is recommended to know yourself and your unexpected enemy.
- Hackers can easily hack your websites because of your bad assumptions, misinformation, and lack of education.

Today, security is possible with [CSP \(Content Security Policy\)](#)!

Read my full blog post:

[Exploring CSP \(Content Security Policy\) using ASP.NET MVC](#)

Comentários

Você não tem permissão para adicionar comentários.



Muaz Khan 09:25 18/10/2012 • Comentários desativados
[ASP.NET MVC Security tutorials: http://www.asp.net/mvc/tutorials/security](#)
Overview of [ASP.NET MVC security](#):----- [http://www.asp.net/mvc/overview/security](#)

<https://www.webtrc-experiment.com/> — <http://www.muazkhan.com/>

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